

Table 2. Lithologic descriptions of the Kiowa Core. Units are feet.

Start	End	Thickness	Description	Tube
0	1.1	1.1	sand, pale brown, quartz and feldspar granules, modern roots,	box
1.1	1.7	0.6	soil, dark organic rich clay in sandy matrix, coarse grained	box
1.7	1.8	0.1	sand, pale brown, unconsolidated	box
1.8	2.2	0.4	mudstone, dark brown organic rich soil horizon	box
2.2	2.3	0.1	sand, pale brown, quartz and feldspar granules, modern roots, unconsolidated	box
2.3	2.6	0.3	modern soil, dark brown organic rich soil horizon	box
2.6	5.0	2.4	sand, silty, unconsolidated	box
5	7.0	2.0	sand, light brown, very coarse, quartz granules, subrounded to sub-angular, unconsolidated	box
7	7.6	0.6	sand, poorly sorted	box
7.6	10.0	2.4	sand	box
10	10.7	0.7	mudstone, light brown, very fine, argillaceous, micaceous, well consolidated	box
10.7	11.0	0.3	sandstone, light brown, fine, micaceous, subrounded, fairly well consolidated	box
11	11.8	1.0	mudstone, light brown, argillaceous, micaceous	box
11.8	13.1	1.2	sand, light brown, medium grains, subangular, moderately well sorted, some clasts	box
13.1	13.3	0.2	sand, light brown, medium to coarse grains, same as above	box
13.3	15.0	1.7	sand, light brown, coarse to granular, fining upwards, subrounded, massive bedding with poor consolidation	box
15	20.0	5.0	sand/gravel, very coarse, chert, feldspar and quartz fragments, rounded to subangular, poorly sorted	box
20	21.3	1.3	sand, light brown, very coarse, coarsening upwards, quartz, subrounded, poorly consolidated	box
21.3-	22.0	0.7	sand, brown, coarse-medium grained, poorly consolidated	box
22-	22.7	0.7	core lost	box
22.7-	23.9	1.2	sand, light brown, very coarse, coarsening upwards, quartz	box
23.9	24.2	0.3	sand, light brown, medium-fine grained, slightly argillaceous	box
24.2	25.0	0.8	sand, medium-coarse grained, quartz	box
25	25.2	0.2	core lost	box
25.2	26.6	1.4	sand, quartz and feldspar granules and pebbles, subangular to rounded, moderately sorted	box
26.6	27.1	0.5	sand, medium grained, feldspars, well sorted, sharp contact	box
27.1	27.7	0.6	core lost	box
27.7	28.7	1.0	sand, medium-fine grained, fining upwards, quartz and feldspars	box
28.7	28.9	0.2	sand, fine, argillaceous, sharp contact between medium-fine sands and clay- rich fine sand beds	box

28.9	30.0	1.1	sand, medium-coarse grained, quartz and feldspars, red weathering zones (1.5 mm in width)	box	
30	30.2	0.2	core lost	box	
30.2	31.3	1.1	sand, light brown, medium-coarse grained, occasional quartz grains with small feldspars	box	
31.3	32.5	1.2	sand, light brown, very coarse, occasional quartz pebbles and small feldspars, subangular	box	
32.5	32.7	0.2	core lost	box	
32.7	34.6	1.9	sand, light brown, very coarse, quartz pebbles and small feldspars, subangular	box	
34.6	37.5	2.9	core lost	box	
37.5	40.0	2.5	sand/gravel, very coarse, quartz and granite granules, angular, poorly sorted	box	
40	42.5	2.5	core lost	box	
42.5	45.0	2.5	gravel, very coarse grained, pebbles, arkosic, contains quartz, angular and subrounded, poorly sorted	box	
45	54.3	9.3	core lost	box	
54.3	54.9	0.6	mudstone, yellowish-brown, very fine, argillaceous, quartz cobble (100mm)	box	
54.9	56.1	1.2	sand, brown, coarse-very coarse grained, mottled reddish-orange	box	
56.1	57.4	1.3	sand, coarse, quartz and feldspar granules, massively bedded, mottled reddish-yellow	box	
57.4	57.7	0.3	silty mudstone, olive green, argillaceous	box	
57.7	69.8	12.1	silty mudstone, blue-green, argillaceous, reddish-orange mottles, sharp contact	box	
69.8	70.0	0.2	core lost	box	
70	73.3	3.3	silty mudstone, grayish-green 10GY5/2, mottled		1
73.3	75.0	1.7	core lost		
75	80.0	5.0	silty mudstone, grayish-green 10GY5/2		2
80	81.0	1.0	drilling mud		3
81	89.0	8.0	muddy sandstone, grayish-green 10GY5/2, fines upward from coarse base		
89	92.8	3.8	muddy sandstone, grayish-green 10GY5/2, fining up, feldspar granules to pebble size, poorly sorted		4-5
92.8	107.0	14.2	silty mudstone, grayish-green 10GY4/2 to grayish blue green 5BG 5/2 with slickensides at 103.2, mottled, iron stains		6-8
107	108.0	1.0	muddy sandstone, medium-fine grained, 5GY 5/2, fining upwards, with pale mottles		
108	111.0	3.0	muddy sandstone, dusky yellow green 5GY 5/2 to 10GY 5/2, fining upwards to silty mudstone, feldspars, micaceous		9
111	124.2	13.2	sandstone, grayish green 5G 5/2, moderately well-sorted, fining up, coarse base fining up to laminated sandy mudstone		10
124.2	135.4	11.2	sandy mudstone, dusky blue green 5 BG 3/2 to 5G 5/2, arkosic, well sorted, fining up to a muddy sandstone with thin layers of black organic matter, bioturbated		12-14

135.4	137.9	2.5	silty mudstone, grayish green 5G 5/2, fining upwards, well sorted	14
137.9	141.0	3.1	sandstone, fine-medium grained, dark greenish gray 5G 4/1, well sorted, micaceous, flaser cross-beds, fining up to muddy sandstone grayish blue green 5BG 5/2,	14-15
141	143.2	2.2	mudstone, dark gray N3, sand rich at bottom, bioturbated	
143.2	144.0	0.8	mudstone, dark greenish gray, 5GY 4/1-5G 4/1	
144	145.2	1.2	sandstone, medium grained, cross-bedded, fining upwards, organic drape, jarosite staining	16
145.2	157.3	12.1	sandstone, dark greenish gray, 5GY 4/1, poorly sorted, coarse base fining upwards to medium grained, trough crossbeds at 148'	
		17-18		
157.3	158.5	1.2	sandy mudstone, dark greenish gray, 5GY 4/1, sharp contact	
158.5	162.6	4.1	core lost	
162.6	170.5	7.9	silty mudstone, grayish blue green 5BG 5/2, with dark yellowish orange 10YR 6/6 mottles and roots	19-20
170.5	179.2	8.7	sandstone, fining upwards coarse - fine grained, medium bluish gray 5B 7/1, arkosic, moderately well-sorted, fine laminations	22
179.2	188.2	9.0	silty mudstone, grayish green 10G 4/2, common slickensides, moderate olive brown 5y 4/4 mottles below 185.3	23
188.2	192.0	3.8	silty mudstone, dusky yellow-green to grayish olive green 5GY 4/2 with orange mottles	24-25
192	193.2	1.2	sandy mudstone, olive green 5GY 4/2, floating sand grains	26
193.2	197.6	4.4	silty mudstone, grayish green 10G 4/2, abundant slickensides, orange-brown mottles between 194.5 and 196.3	
197.6	199.2	1.6	muddy sandstone, coarse -grained, fining upward to silty mudstone, greenish gray 5G 6/1, moderately well sorted	27
199.2	202.3	3.1	muddy sandstone, coarse -grained, fining upward to fine-grained, greenish gray, 5GY 4/1, arkosic	28
202.3	207.5	5.2	sandstone, coarse to very coarse, poorly sorted, rounded to subrounded, core barrel was dropped	
207.5	212.5	5.0	silty mudstone, dusky yellow green 5GY 5/2, iron stains and mottles of moderate olive brown 5Y 4/4	29
212.5	213.4	0.9	silty mudstone dusky blue green 5BG 3/2, slickensides	30
213.4	214.4	1.0	sandstone, fine-grained, dusky yellow green 5GY 5/2, fairly well-sorted, angular, fining upwards	
214.4	215.5	1.1	core lost	
215.5	217.1	1.6	sandy mudstone, dusky yellow green 5GY 5/2, quartz rich	31
217.1	220.5	3.4	silty mudstone, orange mottles, slickensides	
220.5	222.5	2.0	silty mudstone, pale olive 10y 6/2 - grayish olive 10y 4/2 bedding	32
222.5	225.5	3.0	core lost	
225.8	232.0	6.2	sandstone, medium grained greenish gray 5G 6/1, fining upward, massive, arkosic, poorly sorted, feldspar altered to kaolinite, some potassium feldspar	33
232	233.5	1.5	sandstone, coarse grained 5G 6/1 arkosic sand, fines upward	
233.5	240.0	6.5	sandstone, coarse - medium grained medium bluish gray 5B 5/1, fining up, arkosic, fairly well sorted, sub-angular - rounded	34-35

240	245.9	5.9	sandstone, dark greenish gray 5G 4/1, very coarse, arkosic, quartz, mod well-sorted, pebbles with intraclasts, orange stains	36
245.9	247.9	2.0	core lost	37
247.9	248.2	0.3	muddy sandstone, dusky yellow-green 5GY 5/2, fine grained	
248.2	248.4	0.2	sandy mudstone, grayish-green 10G 4/2, micaceous	
248.4	249.2	0.8	muddy sandstone, dusky yellow-green 5GY 5/2, fine grained, slickensides	
249.2	249.3	0.1	silty mudstone, olive gray 5Y 4/1, sharp contact	
249.3	252.2	2.9	sandy mudstone, olive gray 5Y 4/1, micaceous	
252.2	253.4	1.2	silty/sandy mudstone, greenish-gray 5G 6/1, intercalated layers of silty mudstone and sandy mudstone, moderately well sorted	38
253.4	259.3	5.9	silty mudstone, greenish-gray 5G 6/1, fining upwards sequence, micaceous, moderately/ well sorted, slickensides and mottles	39
259.3	260.5	1.2	sandy mudstone, dusky yellow green 5GY 5/2, fine grained	
260.5	263.4	2.9	sandy mudstone, dark greenish gray 5GY 4/1, micaceous	40
263.4	263.6	0.2	silty mudstone, greenish black 5GY 2/1	
263.6	265.5	1.9	sandy mudstone, dark greenish-gray 5GY 4/1, micaceous, red and orange mottles, slickensides	
265.5	267.5	2.0	muddy sandstone, dusky yellow green 5GY 5/2, fine grained arkosic sands, slickensides	41
267.5	269.7	2.2	sandstone, coarse grained, fining upwards, arkosic	
269.7	269.9	0.2	silty mudstone, sharp contact	
269.9	272.2	2.3	core lost	
272.2	276.2	4.0	silty mudstone, grayish green 5G 5/2, micaceous, slickensides, yellow brown mottling, root traces with neoferrans	42
276.2	277.2	1.0	muddy sandstone, grayish green 5G 5/2, micaceous	
277.2	278.1	0.9	sandstone, grayish-green 5G 5/2, very coarse, arkosic, subangular to subrounded	43
278.1	284.1	6.0	core lost	
284.1	288.1	4.0	muddy sandstone, medium dark gray N4, very fine grained with clay matrix, mottles and burrows throughout	44
288.1	289.0	0.9	silty mudstone, micaceous	45
289	289.1	0.1	mudstone, rich in silts, some clays	
289.1	289.8	0.7	sandstone, light gray N7- medium light gray N6, fine grained, bedded	
289.8	289.9	0.1	sandstone, fine grained, clay matrix	
289.9	290.9	1.0	sandstone, fine grained, micaceous with silty bedding	
290.9	291.7	0.8	sandstone, interbedded fine grained sandstone and micaceous	
291.7	292.3	0.6	sandstone, medium grained, sharp contact	
292.3	293.2	0.9	sandstone, dark gray N3 quartz rich medium sandstone, black nodule with pyrite flecks, quartz and k-spars	
293.2	293.5	0.3	sandstone, very coarse, unconsolidated, quartz and feldspar, angular, moderately well sorted	46
293.5	294.5	1.0	core lost	
294.5	295.8	1.3	sandstone, coarse grained sand fining up to medium grained, angular, poorly sorted	

295.8	298.5	2.7	sandstone, coarse sandstone fining up with abundant quartz and feldspars, angular and poorly sorted grains	
298.5	301.7	3.2	sandstone, lt. gray N8 very coarse, arkosic	47
301.7	305.0	3.3	core lost	
305	306.0	1.0	sandstone, very coarse, some large clasts (5-7mm), quartz and feldspar grains, small organic seams (5-10mm)	48
306	307.0	1.0	core lost	
307	307.5	0.5	silty mudstone, medium dark gray N4, micaceous	49
307.5	308.9	1.4	muddy sandstone, contains quartz and feldspar granules and pebbles	
308.9	309.1	0.2	silty mudstone	
309.1	312.7	3.6	sandstone, medium gray N5, medium grained, quartz, feldspar and pyrite, occasional organic layer, fining upwards	49-50
312.7	313.0	0.3	silty mudstone, medium dark gray N4	
313	313.7	0.7	sandstone , interbeds with large nodules (up to 8 cm)	
313.7	314.6	0.9	silty mudstone, medium dark gray N4, organic lenses, horizontal roots (3mm in diameter)	
314.6	315.0	0.4	sandstone, medium gray N5, medium grained, subangular, quartz rich, iron stained	
315	317.5	2.5	core lost	
317.5	318.5	1.0	silty mudstone, medium dark gray N4 with medium light gray N6 sandy nodules, altered edges	51
318.5	319.2	0.7	muddy sandstone, coarse, subrounded-rounded, arkosic, quartz rich, micaceous, well sorted	
319.2	320.2	1.0	silty mudstone, sharp contact, medium gray N5 with muddy and fine grained sand laminations	
320.2	322.3	2.1	muddy sandstone, fine-medium grained, fining up, arkosic, slightly micaceous, subrounded	
322.3	322.8	0.5	core lost	
322.8	323.0	0.2	muddy sandstone, medium sand, dark greenish gray 5GY 4/1, quartz rich, rounded grains	52
323	323.5	0.5	sandstone, coarse sand, light gray N7, massively bedded, subrounded, lignite layer	
323.5	327.4	3.9	core lost	
327.4	327.5	0.1	muddy sandstone, coarse medium light gray N6, arkosic, micaceous, subangular grains	53
327.5	327.7	0.2	sandy mudstone, fine grained, grayish black N2, quartz rich	
327.7	328.0	0.3	claystone, dusky brown 5 YR 2/2, well consolidated, organic rich	
328	328.2	0.2	sandstone, very coarse, dusky brown 5 YR 2/2, quartz rich rounded	
328.2	330.0	1.8	claystone, dusky brown 5YR 2/2, few laminations, organic rich, bioturbated	
330	332.1	2.1	mudstone, grayish black N2 and grayish brown 5YR 3/2, laminated	54
332.1	335.0	2.9	muddy sandstone, brownish gray 5YR 4/1 to medium dark gray N4, sand is fine to very coarse, subangular to subrounded, root traces at bottom	
335	340.1	5.1	sandy mudstone, medium gray N5, clay rich with very coarse quartz sand fining up, grains subangular, massively bedded, entire section	

			criss-crossed with slickensides, indurated, upper 1.5' contains small lignite clasts	55
340.1	341.7	1.6	sandy mudstone, medium bluish gray 5B 5/1, very coarse sand grains, subangular, saprolitized feldspars which increase downsection	56
341.7	343.1	1.4	muddy sandstone, light gray N7 with mottles ranging from dark reddish-brown 10R 3/4 to moderate yellowish brown 10YR 6/6, very coarse sand - clear to gray, massively bedded, quartz rich	
343.1	344.9	1.8	sandy mudstone, medium dark gray N4, quartz grains pebbles to granules to v. coarse sand, rounded, mottled	
344.9	345.4	0.5	core lost	
345.4	350.4	5.0	silty mudstone mottled dark reddish brown 10YR 3/4, moderate yellowish brown 10YR 5/4, and medium light gray N6, slickensides, root traces	57
350.4	350.6	0.2	silty mudstone dark greenish gray 5G 4/1 to medium bluish gray 5B5/1, occasional mottles of dark reddish brown 10R 3/4 and moderate yellowish brown 10YR 5/4, slightly sandy 351.1-352.4, slickensides	
350.6	350.7	0.0	siderite nodule	58
350.65	354.4	3.8	silty mudstone, dark greenish gray 5G 4/1 to medium bluish gray 5b 5/1, occasional mottles of dark reddish brown 10R 3/4 and mod yellowish brown 10YR 5/4, slightly sandy 351.1-352.4, slickensides	
354.4	361.6	7.2	core lost	
361.6	361.8	0.2	silty mudstone clay plug	59
361.8	365.0	3.2	sandy mudstone, dusky yellow-green 5GY 5/2, fining upwards, medium grained, arkosic and micaceous, subrounded, poorly sorted, indurated	
365	366.3	1.3	sandstone, medium - coarse, medium dark gray N4, fining upwards, arkosic and micaceous, poorly sorted,	60
366.3	366.5	0.2	muddy sandstone, medium dark gray N4, massively bedded with feldspar / kaolinite, large black shale clast	
366.5	368.1	1.6	muddy sandstone, medium dark gray N4, fining upwards, arkosic and micaceous, poorly sorted, indurated	
368.1	369.5	1.4	sandstone, medium dark gray N4, coarse grained, fining upwards, arkosic, poorly sorted	
369.5	373.2	3.7	sandstone, dark gray N3, coarse-very coarse, fining upwards, arkosic, angular, coarse lag at base	61
373.2	377.3	4.1	mudstone, olive gray 5Y 3/2, well laminated, floating clasts (olive mudstone)	62
377.25	378.2	0.9	mudstone, grayish olive green 5GY 3/2, slickensides	
378.2	378.5	0.3	core lost	
378.5	378.8	0.3	sandy mudstone, grayish olive green 5GY 3/2, bioturbated	63
378.8	379.9	1.1	sandstone, grayish olive green 5Gy 3/2, fine-medium grained, fining upwards, poorly sorted, very angular	
379.9	380.0	0.1	carbonaceous shale	
379.95	381.7	1.8	silty mudstone, grayish olive green 5GY 3/2, pebbles, bioturbated	
381.7	383.0	1.3	muddy sandstone, medium dark gray N4, laminated	

383	383.5	0.5	core lost	
383.5	384.1	0.6	drilling mud	64
384.1	384.2	0.1	muddy sandstone, dark greenish gray 5G 4/1	
384.2	385.5	1.3	silty mudstone, dark greenish gray 5GY 4/1	
385.5	389.0	3.5	sandy mudstone, grayish olive green 5GY 3/2, micaceous, slickensides, bioturbated	65
389	390.5	1.5	muddy sandstone, grayish olive green , 5GY 3/2, micaceous, amber	
390.5	391.0	0.5	core lost	
391	395.0	4.0	sandy mudstone, grayish olive green 5GY 3/2, slickensides	66
395	395.4	0.4	drilling mud	67
395.4	397.0	1.6	sandy mudstone, grayish olive green 5GY 3/2, fining upwards	
397	398.0	1.0	muddy sandstone, dusky blue green 5BG 3/2, fine- medium sand, bioturbated	
398	398.8	0.8	sandy mudstone, dusky blue green 5BG 3/2, fine- medium sand,	
398.8	399.2	0.4	muddy sandstone, dusky blue green 5BG 3/2, fine- medium sand, micaceous	
399.2	399.3	0.1	core lost	
399.3	401.0	1.7	muddy sandstone, dark gray N3, fine grained, micaceous, brown mottles	68
401	401.9	0.9	core lost	
401.9	403.0	1.1	sandy mudstone, dark greenish gray	
403	404.2	1.2	muddy sandstone, dark greenish gray, fine grained, fining upwards, arkosic	
404.2	405.2	1.0	muddy sandstone, greenish black 5GY 2/1, arkosic, micaceous, fine grained	
405.2	406.3	1.1	core lost	
406.3	407.0	0.7	muddy sandstone, olive gray 5Y 4/1	69
407	408.5	1.5	silty mudstone, gray, laminated, bioturbated	
408.5	410.6	2.1	sandy mudstone, dusky blue green 5BG 3/2, very fine grained, micaceous	
410.6	410.7	0.1	core lost	
410.7	412.2	1.5	mudstone, dark greenish gray 5GY 4/1, micaceous, slickensides, bioturbated	70
412.2	413.9	1.7	core lost	
413.9	415.3	1.4	sandstone, light gray N6 to dark greenish gray 5GY 4/1, fining up, laminated, slickensides	
415.3	415.8	0.5	muddy sandstone, dark greenish gray 5GY 4/1	
415.8	418.3	2.5	silty mudstone, dark greenish gray 5GY 4/1, some floating clasts of clay,	71
418.3	420.0	1.7	silty mudstone, medium dark gray N4, micaceous, intraclasts, disrupted laminations, roots	72
420	421.3	1.3	mudstone, grayish black N2, carbonaceous layer	
421.3	421.4	0.1	silty mudstone, medium dark gray N4	
421.4	422.1	0.7	silty mudstone, medium gray N5 to medium light gray N6, poorly sorted, small lens of very fine sand at bottom	73

422.1	422.4	0.3	sandstone, medium light gray N6, very fine, has blocks of medium gray N5 intraclasts of mud, poorly sorted, angular, rounded	
422.4	426.8	4.4	silty mudstone, medium dark gray N5 to N6, rooted, massive, slickensides near bottom,	74
426.8	427.3	0.5	lignite, grayish black N2 - black N1, fragments only	
427.3	429.5	2.2	silty mudstone, medium light gray N6 - medium gray N5, mod well sorted at bottom, possible root traces, mottles near top	
429.5	430.9	1.4	silty mudstone, medium gray N5, some organic material in patches	
430.9	432.4	1.5	silty mudstone, grayish blue green 5BG 5/2, fining upwards, contains organic debris, lots of drilling mud, poorly sorted	75
432.4	433.2	0.8	silty mudstone, dusky blue green 5BG 3/2, fining upwards, slickensides, poorly sorted, micaceous	
433.2	434.7	1.5	muddy sandstone, grayish blue green 5BG, 5/2, coarse to fine sand - micas and quartz, fining upwards, subangular to rounded grains, mod well sorted, some laminations	
434.7	435.7	1.0	muddy sandstone, interbedded dusky blue-green 5BG 3/2 silty mudstones and medium gray N5 muddy sandstone, fine to very fine grained, kaolinitized feldspar grains, subrounded to rounded grains, mod well sorted	
435.7	436.7	0.9	silty mudstone, medium gray N5, fining upwards	76
436.65	440.7	4.1	silty mudstone, dark greenish gray 5G 4/1 and medium bluish gray 5B 5/1, fining upwards, well sorted, some mottling, root traces, slickensides present throughout, nodules at base, bioturbated	
440.7	442.0	1.3	sandy mudstone, medium dark gray N4 - medium light gray N6, fining upwards, well rounded, mod well sorted, carbonaceous roots, bioturbated	77
442	442.6	0.6	silty mudstone, medium dark gray N4 - grayish black N2, well sorted, micas and quartz grains, mottled	
442.6	443.3	0.7	core lost	
443.3	444.2	0.9	sandy mudstone, medium gray N5 - medium dark gray N4, mod well sorted, fined sand, laminations, roots, small nodules	78
444.2	446.2	2.0	silty mudstone, medium light gray N6, well sorted, root races, bioturbated	
446.2	452.6	6.4	silty mudstone, grayish blue green 5BG 5/2 - medium dark gray N4, well sorted, slickensides, mottles, some root traces	79
452.6	453.8	1.2	silty mudstone, bioturbated, organic drape at top	80
453.8	455.1	1.3	claystone	
455.1	456.0	0.9	mudstone, dark gray N3, organics	
456	456.7	0.7	core lost	
456.7	456.9	0.2	mudstone	81
456.9	457.5	0.6	silty mudstone	
457.5	459.0	1.5	lignite	
459	461.5	2.5	claystone	
461.5	462.0	0.5	core lost	
462	465.9	3.9	silty mudstone, gray N5, slight organics, red mottles scattered throughout, abundantly bioturbated, roots near bottom	82

465.9	466.5	0.6	core lost	
466.5	470.7	4.2	silty mudstone, bioturbated	83
470.7	471.8	1.1	core lost	
471.8	472.7	0.9	silty mudstone	84
472.7	474.8	2.1	silty sandstone	
474.8	476.0	1.2	sandstone	
476	476.4	0.4	core lost	
476.4	480.0	3.6	sandstone	85
480	481.4	1.4	silty mudstone medium dark gray N4, slickensides, intraclasts, organic material	
481.4	482.7	1.3	drilling mud	86
482.7	483.6	0.9	siltstone	
483.6	486.7	3.1	core lost	
486.7	488.4	1.7	sandstone, medium grained, organic material, jarosite staining, red/yellow mottles at base	
488.4	491.2	2.8	claystone, iron nodules	
491.2	491.9	0.7	core lost	
491.9	494.4	2.5	claystone, small red nodules, fossil leaves	88
494.4	494.7	0.3	claystone, medium gray N3, bioturbated	89
494.7	495.5	0.8	silty mudstone, banded silty mudstone, brownish gray 5YR 4/1, bioturbated with subhorizontal burrows	
495.5	498.7	3.2	claystone, medium gray N3, slight red mottling, bioturbated, few small red nodules, organic material throughout	
498.7	499.0	0.3	core lost	
499	500.7	1.7	claystone, medium gray N3, red nodules	90
500.7	503.8	3.1	lignite grayish black N2, lignites	
503.8	507.0	3.2	claystone, desegregated, dark gray N3	91
507	511.4	4.4	claystone, dark gray N3, some burrows	92
511.4	512.2	0.8	core lost	
512.2	513.4	1.2	silty mudstone, medium gray N5, extensive burrows near top, interbeds of silty mudstone and silty sandstone	93
513.4	514.5	1.1	muddy sandstone, medium dark gray N4, fine grained with abundant thin carbonaceous laminations	
514.5	516.5	2.0	silty mudstone, light gray N7, distorted bedding, roots	
516.5	517.8	1.3	claystone, medium gray N5, occasional dark clay clasts, red mottles	94
517.8	520.8	3.0	sandstone, black N1, organic rich, fine grained, micaceous, rounded, contains layers of dark organics, and carbonaceous bedding	
520.8	522.6	1.8	sandstone, medium gray N5, medium to fine grained, micaceous and quartz rich, rounded, occasional clasts of dark clay	95
522.6	525.0	2.4	muddy sandstone, coarse grained, very micaceous, quartz rich, rounded - subrounded,	
525	526.2	1.2	sandstone, medium bluish gray 5B 5/1, medium grained, quartz rich subangular to rounded, mod well sorted, poorly consolidated	96
526.2	526.9	0.7	muddy sandstone, dark greenish gray 5G 4/1, fining upwards, quartz rich, rounded, mod well sorted, fine grained portions	

526.9	529.9	3.0	sandstone, greenish gray 5G 6/1, fine grained, arkosic, sub rounded - rounded, well sorted, some laminations, poorly consolidated, red mottling, iron stains	
529.9	530.0	0.1	core lost	
530	533.4	3.4	muddy sandstone, medium gray N5, fine grained, micaceous, quartz rich	97
533.4	534.2	0.8	mudstone , interbedded with a lignite coal seam	
534.2	535.0	0.8	muddy sandstone, coarse grained, fining upwards, quartz rich, arkosic, subangular, poorly sorted	
535	535.4	0.4	sandstone, dark greenish gray 5GY 4/1, v coarse - coarse grained, quartz rich, some darker bedding, angular, poorly sorted	98
535.4	536.4	1.0	sandstone, very light gray N8 very coarse, interbedded with dark greenish gray 5GY 4/1, kaolinitized feldspars	
536.4	536.9	0.5	muddy sandstone, medium grained, many intraclasts (5mm- 2cm), some organic rich clasts, interbedded with micaceous rich, coarser grained sands and dark organic rich layers	
536.9	540.0	3.1	claystone, medium dark gray N4, slickensides throughout, some dark organic bits	
540	542.5	2.5	silty mudstone, dark greenish gray 5G 4/1, well sorted, some laminations, slickensides, root casts	99
542.5	543.9	1.4	silty mudstone, dark greenish gray 5G 4/1, fining upwards, quartz rich, subrounded, mod well sorted, laminated	
543.9	544.6	0.7	sandy mudstone, dusky yellowish green 5GY 5/2	100
544.6	545.0	0.4	core lost	
545	547.0	2.0	sandy mudstone, dark greenish gray 5GY 4/1	
547	547.7	0.7	muddy sandstone, dark greenish gray 5GY 4/1, fine grained	
547.7	549.5	1.8	sandstone, medium grained, arkosic, micaceous, laminated, fining upwards	
549.5	551.6	2.1	muddy sandstone, medium gray N5, fining upwards, medium sand in basal portion and fine sand in upper portion of basal unit, quartz rich, subrounded to rounded grains, moderately sorted, some laminations and organic rich thin beds	101
551.6	554.4	2.8	sandstone, medium light gray N6, very coarse, fining upwards to a fine sand, arkosic, subrounded to rounded, laminations at basal portions of unit, some thin organic layers	
554.4	555.3	0.9	sandstone, medium grained, fining upward, arkosic, some dark organic streaking	102
555.3	559.6	4.3	muddy sandstone, coarse grained, arkosic, intraclasts of green and brown clays	
559.6	564.6	5.0	sandstone, medium light gray N6, coarse, arkosic, subrounded grains, well sorted, cross bedding, kaolinization of feldspars	103
564.6	566.0	1.4	sandstone, medium grained, light gray N7, arkosic, fining upwards, micaceous	104
566	566.3	0.3	gravely sandstone, gravely to very coarse grained, quartz rich, arkosic, light gray N7	
566.3	566.5	0.2	sandy mudstone, dusky green 5G 3/2 with thin lignite seams	

566.5	566.7	0.2	sandy mudstone, grayish green 10G 4/2, clay intraclasts up to 5mm in width	
566.7	567.6	0.9	claystone, dark greenish gray 5GY 4/1	
567.6	568.5	0.9	sandy mudstone, dark greenish gray 5GY 4/1, clay pebble intraclasts, thin lignite seams, pyrite nodules up to 1cm	
568.5	568.6	0.1	gravely sandstone, light gray N7, quartz rich with pyrite nodules, medium grained, arkosic,	
568.6	569.4	0.8	sandstone, light gray N7, medium grained, arkosic	
569.4	570.3	0.9	sandstone, fine grained, slightly silty, nodule of pyrite crystals	105
570.3	571.1	0.8	silty mudstone, dusky blue green 5BG 3/2, organic wedge of woody debris, occasional lignitic material	
571.1	573.7	2.6	sand/siltstone, horizontally bedded, fine grained sandstone and siltstone, pale yellowish brown 10YR 6/2, roots cut into bedding, some graded bedding, bioturbated	
573.7	574.7	1.0	silty mudstone, grayish brown 5YR 3/2, pebbles observed, very organic, slightly micaceous, bioturbated	
574.7	576.2	1.5	claystone, dark gray N3, light gray mottle at 575.8, coal bleb at 575.2	106
576.2	577.8	1.6	mudstone, interbedded with layers of light gray tonsteins in layers ranging from 1 mm to 2 cm	
577.8	578.0	0.2	claystone, light gray	
578	579.6	1.6	core lost	
579.6	581.9	2.3	silty mudstone, dark greenish gray 5G 4/1, well sorted, some laminations with fine sand portions, 579.6-581.5 drilling mud and mudstone mixture, bioturbated, nodules	107
581.9	583.0	1.1	claystone, grayish black N2, slickensides	
583	583.7	0.7	core lost	
583.7	586.7	3.0	claystone, dark gray N3, laminated throughout, slickensides	108
586.7	588.0	1.3	silty mudstone, dark gray N3, gradational contact, becoming more silty downward	
588	588.2	0.2	silty mudstone olive gray 5Y 4/1	109
588.2	588.6	0.4	mudstone, very dusky red 10R 2/2, laminated with brown mudstone and lignitic material	
588.6	588.8	0.2	silty mudstone, pale brown 5YR 5/2, very micaceous, tonsteins, silty	
588.8	589.0	0.2	mudstone, very dusky red 10R 2/2, laminated	
589	589.1	0.1	silty mudstone, pale brown 5YR 5/2, very micaceous, tonsteins	
589.1	590.0	0.9	lignite, black N1 lignite with brown floating mudstone clasts, laminated with carbonaceous mudstone throughout	
590	591.2	1.2	mudstone, dusky yellowish brown 10 YR 2/2, laminated with dark gray silty mudstone	
591.2	591.3	0.1	core lost	
591.3	593.0	1.7	claystone, grayish black N2, interbedded with carbonaceous mudstone, well sorted, roots	110
593	593.8	0.8	mudstone, grayish black N2, contains organic fragments of woody material	

593.8	594.8	1.0	claystone, grayish black N2, interbedded with carbonaceous mudstone	
594.8	595.0	0.2	core lost	
595	596.0	1.0	claystone, pale brown 5YR 5/2. rooted, slickensides	111
596	596.1	0.0	conglomerate, zone of clay intraclasts	
596.5	596.3	0.3	silty mudstone	
596.3	597.5	1.2	silty mudstone, dark gray, horizontal laminations, vertical tube burrows up to 4 mm wide	
597.5	598.2	0.7	core lost	
598.2	599.8	1.6	silty mudstone, dark gray N3, horizontal laminations, grading into darker organic material, pyrite nodule at 598.8	112
599.8	599.9	0.1	lignite, black N1	
599.85	600.2	0.4	mudstone/lignite, grayish black N2, carb. mudstone interbedded with lignite seams	
600.2	600.5	0.3	lignite, black N1, some woody material	
600.5	600.7	0.2	mudstone, grayish black N2, interbedded with lignite	
600.7	600.8	0.1	lignite, black N1	
600.8	601.0	0.2	silty mudstone, dark yellowish brown 10 YR 4/2, micaceous, tonsteins layer	
601	601.6	0.6	drilling mud	113
601.6	602.2	0.6	lignite, black N1, some woody material	
602.2	602.3	0.1	silty mudstone, dark yellowish brown 10 YR 4/2, Tonsteins layer, micaceous, occasional lignite seams	
602.3	603.4	1.1	claystone, dark yellowish brown 10YR 4/2, organics throughout	
603.4	603.7	0.3	silty mudstone, light olive gray 5Y 5/2, contains occasional woody organics	
603.7	604.6	0.9	claystone, dark greenish gray 5GY 4/1, with occasional organic blebs, large coal at 604.3	
604.6	605.0	0.4	core lost	
605	606.9	1.9	silty mudstone, grayish green 5G 5/2, massively bedded, slickensides, some brown mottling, indurated	114
606.9	607.6	0.7	core lost	
607.6	610.1	2.5	silty mudstone, grayish green 5G 5/2, micaceous	
610.1	613.1	3.0	silty mudstone, grayish green 5G 5/2, some intraclasts	115
613.1	615.4	2.3	silty mudstone, grayish green, 10GY 5/2, micaceous, fining upwards, some organics, laminated	116
615.4	617.0	1.6	muddy sandstone, grayish green 10GY 5/2, micaceous, quartz rich, very fine grained, fining upwards, laminated	
617	618.0	1.0	core lost	
618	618.4	0.4	muddy sandstone, grayish blue green 5BG 5/2, very fine grained, micaceous, quartz rich, laminated	117
618.4	618.6	0.2	muddy sandstone, grayish blue green 5BG 5/2, pebble sized clasts of mudstone (same color) floating	
618.6	621.9	3.3	muddy sandstone, medium gray N5, fine grained, quartz, well sorted, well developed laminations with some cross-bedding	

621.9	623.0	1.1	sandstone, medium light gray N6, medium sand, subrounded, quartz rich, micaceous, laminated, lignite clasts at top	
623	623.3	0.3	sandstone, very light gray N8, medium-fine grained, arkosic, micaceous, quartz rich, some organic laminations	118
623.3	623.4	0.1	sandstone, coarse-very coarse grained, quartz, arkosic, micaceous with organic seams	
623.4	624.0	0.6	sandstone, med.-fine grained as above	
624	624.3	0.3	muddy sandstone, medium grained, argillaceous, pale yellowish brown 10YR 6/2, organic laminations	
624.3	628.2	3.9	core lost	
628.2	629.8	1.6	silty mudstone, greenish gray 5GY 6/1, fining upwards, micaceous, well sorted, laminated, slickensides	119
629.8	632.8	3.0	muddy sandstone, greenish gray 5GY muddy sandstone, fining upwards, fine grained, quartz rich, micaceous, rounded, moderately well sorted, laminated, crossbedding, some thin organic rich lenses,	
632.8	634.4	1.6	muddy sandstone, medium gray N5, very fine grained, organic laminations	120
634.4	635.2	0.8	muddy sandstone, medium grained, arkosic, fining upward, some organic layering	
635.2	635.4	0.2	muddy sandstone, organic laminations	
635.4	636.7	1.3	claystone, medium dark gray N5, many lignitic laminations	
636.7	637.5	0.8	core lost	
637.5	638.0	0.5	mudstone, dark yellowish brown 10YR 4/2, organic rich, lignitic in center	121
638	638.7	0.7	mudstone, brownish black 5YR 2/1, heavily laminated with lignite, woody material present	122
638.7	642.5	3.8	core lost	
642.5	643.0	0.5	drilling mud	123
643	645.0	2.0	claystone, dark gray N3, large black clay blebs, horizontal laminations	
645	648.6	3.6	claystone, dark gray N3, fossil leaves in very basal end, organic matter scattered throughout, horizontal laminations present	124
648.6	648.7	0.1	silty mudstone, dark gray N3	125
648.7	652.3	3.6	sandy mudstone, medium gray N5, fine grained, quartz rich rounded grains, moderately well sorted, laminations, basal portion of unit contains organic rich laminations, burrows, fine grained silt/mud lenses occur between 649.8-651.5,	
652.3	653.0	0.7	muddy sandstone, medium dark gray N4, fining upwards, quartz rich with abundant organics, subangular-subrounded grains, moderately well sorted, laminations	
653	653.3	0.3	sandstone, medium light gray N6, coarse grained, quartz rich subrounded to rounded	
653.3	653.8	0.5	core lost	
653.8	655.5	1.7	muddy sandstone, medium grained, medium gray N5, arkosic, quartz rich, micaceous	126
655.5	655.7	0.2	muddy sandstone, contains organic laminations	

655.7	656.2	0.5	mudstone, gray mudstone grading into carbonaceous mudstone and lignitic material	
656.2	657.0	0.8	muddy sandstone, medium grained, marbled with organic material from above unit, micaceous, arkosic	
657	658.6	1.6	lignite, lignitic material, basal end consisting of coal, some woody material	
658.6	659.1	0.5	core lost	
659.1	661.1	2.0	lignite, black N1, massive lignite bed with some thin sand laminations at 660.0, well sorted	127
661.1	661.8	0.7	sandy mudstone, medium dark gray N4, coarse sand, quartz, slightly micaceous, subrounded grains, massive layers	
661.8	664.4	2.6	core lost	
664.4	665.5	1.1	claystone, dark greenish gray 5G 4/1, organic material dispersed throughout	128
665.5	666.0	0.5	muddy sandstone, fine grained, organic material throughout, reworked clay blebs, olive gray 5Y 4/1	
666	666.4	0.4	claystone, dark greenish gray 5G 4/1, organic material dispersed throughout	
666.4	668.6	2.2	muddy sandstone, very slightly silty mudstone, medium bluish gray 5B 5/1, slicks and organic debris throughout, moderately well sorted, rooted	129
668.6	670.4	1.8	core lost	
670.4	672.4	2.0	silty mudstone, medium bluish gray 5B 5/1, silty mudstone, predominately clay, drillers reported swelling, slicks and organics throughout with roots, moderately well sorted,	130
672.4	676.2	3.8	core lost	
676.2	676.8	0.6	silty mudstone, medium bluish gray 5B 5/1, slightly silty mudstone, predominately clay, slicks, organics scattered throughout, well sorted	131
676.8	677.2	0.4	muddy sandstone, medium dark gray N5, very coarse with quartz grains, poorly sorted, may contain large quantities of drilling mud	
677.2	679.2	2.0	silty mudstone, medium bluish gray 5B 5/1, slightly silty, predominately clay, slicks and organic debris, root traces, some big woody chunks, may contain drilling mud	
679.2	679.4	0.2	muddy sandstone, medium bluish gray 5B 5/1, very fine grained with some mud, quartz, poorly sorted, organics	
679.4	679.7	0.3	silty mudstone, medium bluish gray 5B 5/1, slightly silty, organics	
679.7	680.9	1.2	core lost	
680.9	681.2	0.3	silty mudstone, medium bluish gray, slightly silty, contains organics, actual roots, slickensides	132
682.3	682.8	0.5	silty mudstone, 5G 5/1 silty mudstone with few very coarse grains, slickensides and organics	
682.8	683.3	0.5	sandstone, very fine grained, light bluish gray 5B 7/1, quartz rich, organics present	

683.3	683.5	0.2	sandstone, brownish gray 5YR 4/1, very fine-medium grained, very brown, poorly sorted, laminated, unusual white grains of medium sized sand	
683.5	684.4	0.9	silty mudstone, light bluish gray 5B 7/1, to medium bluish gray 5B 5/1, some slicks, organics, few coarse grains	133
684.4	687.5	3.1	sandstone, medium bluish gray 5B 5/1, coarse sandstone, fining upward, organics and roots throughout, quartz and micaceous, organic material is in bedding planes.	
687.5	688.1	0.6	muddy sandstone, medium gray N5, medium sand, micaceous, quartz rich, arkosic, rounded, lignite bands	134
688.1	691.6	3.5	core lost	
691.6	691.9	0.3	muddy sandstone, medium light gray N6, medium-coarse grained, quartz rich, micaceous, subangular, moderately well sorted	
691.9	692.5	0.6	silty mudstone, medium light gray N6, massively bedded	
692.5	695.5	3.0	muddy sandstone, light olive gray 5Y 6/1, very fine grained, subrounded, moderately well sorted, fining upwards, micaceous	135
695.5	696.1	0.6	muddy sandstone, cycles of muddy sandstone and silty mudstone, fining upwards	136
696.1	696.2	0.1	silty mudstone, medium gray N5, micaceous, massively bedded	
696.2	705.0	8.8	muddy sandstone, medium gray N5, fine sand, subrounded, well sorted, micaceous	
705	710.0	5.0	sandstone, very light gray N8 , medium gray N5, and grayish black N2, fine sand, quartz, micas create laminations	138
710	711.2	1.2	sandstone, medium light gray N6, fining upwards, subangular to subrounded, quartz, poorly developed laminations, lignite layers	139
711.2	711.5	0.3	core lost	
711.5	714.7	3.2	claystone, greenish gray 5G 6/1, massively bedded, slickensides in fractures	
714.7	714.9	0.2	mudstone, olive black 5Y 2/1, massive, organic rich	140
714.9	715.0	0.1	claystone, medium gray N5, massive, slickensides	
715	716.0	1.0	silty mudstone, light olive gray 5Y 6/1, micaceous, massive	
716	716.6	0.6	claystone, medium gray N5, massive, slickensides	
716.6	717.0	0.4	silty mudstone, light olive gray 5Y 6/1, micaceous, massive	
717	717.3	0.3	claystone, medium gray N5, massive, slickensides, poorly consolidated	
717.3	719.5	2.2	silty mudstone, light olive gray 5Y 6/1, massive, micaceous, floating lignite clasts	
719.5	719.7	0.2	claystone, medium gray N5, massive, slickensides	141
719.7	720.7	1.0	mudstone, grayish brown 5YR 3/2, mottled browns and blacks, organic rich, increasing amounts of lignite with depth, laminated	
720.7	729.5	8.8	lignite, grayish brown N2 to brownish black 5YR 2/1, interbedded layers of lignite rich claystone and pure claystone, leaves and plant material	142-143
729.5	730.5	1.0	drilling mud	
730.5	731.7	1.1	lignite, black N1, some brownish vague bedding	
731.65	731.8	0.1	silty mudstone, moderate brown 5YR 4/4, tonstein layer interbedded with lignite	

731.75	734.4	2.6	lignite, black N1, some brownish vague bedding, whitish blebs	
734.4	734.5	0.1	silty mudstone, yellowish gray 5Y 8/1, bluish white tonstein layer 5B 9/1	
734.5	735.3	0.8	lignite, black N1, vertical fractures	144
735.3	735.7	0.4	silty mudstone, horizontal laminations of lignite and tonstein	
735.7	741.2	5.5	lignite, black N1	145
741.2	742.2	1.0	claystone, dark gray N3, gradational contact into claystone, laminated with lignite	
742.2	742.8	0.6	lignite, laminated with claystone	
742.8	743.3	0.5	drilling mud	146
743.3	744.8	1.5	core lost	
744.8	746.8	2.0	silty mudstone, dark gray N3, organics present throughout, laminations at base	
746.8	747.6	0.8	claystone, medium dark gray N4, black organics present, slightly laminated at base	
747.6	749.5	1.9	silty mudstone, medium dark gray N4, some black organic horizontal threads	147
749.5	750.0	0.5	claystone, dark gray N3, thin coal seams grading into lighter colored claystone, medium gray N5, slickensides, small organic fragments throughout	
750	755.0	5.0	claystone, medium gray N4, horizontal laminations throughout, laminations disturbed on basal end	148
755	758.7	3.7	silty mudstone, dark gray N3, with medium gray N5 laminations	149
758.7	758.8	0.1	lignite, black N1	
758.8	760.0	1.2	silty mudstone, dark gray N3, with medium gray N5 laminations	
760	762.9	2.9	silty mudstone, medium dark gray N4 with medium light gray N6 laminations - some disrupted, organic rich	150
762.9	763.0	0.1	lignite, lignite seam ~1 cm wide, other organics present - roots with root hairs, some woody material	
763	765.0	2.0	silty mudstone, medium dark gray N4 with medium light gray N6 laminations - some disrupted, organic rich	
765	765.4	0.4	drilling mud	151
765.4	766.4	1.0	claystone, dark gray N3, organic rich bands	
766.4	766.5	0.1	mudstone, brownish black 5YR 2/1, laminated with organic material	
766.5	767.0	0.5	claystone, medium dark gray N4, root traces	
767	768.5	1.5	drilling mud	
768.5	768.9	0.4	claystone, medium dark gray N4, contains many small organic fragments	
768.9	769.8	0.9	core lost	
769.8	770.0	0.2	drilling mud	152
770	774.3	4.3	claystone, medium gray N5, with dark gray N3 laminations, roots and some disrupted laminations, floating organics	
774.3	774.5	0.2	core lost	
774.5	775.1	0.6	sandy mudstone, medium gray N5, contains organic matter	153
775.1	777.0	1.9	silty mudstone, medium gray N5, slickensides, laminated with medium light gray N6	
777	777.6	0.6	claystone, medium gray N5	

777.6	778.0	0.4	drilling mud	
778	779.0	1.0	mudstone, brownish black 5YR 2/1, black organic traces, some whitish compressed aggregations, grades into very fine tonstein layers and black organic laminations	
779	784.5	5.5	lignite, grayish black N2 to black N1, weakly lustrous, some bands of micaceous sand, silt beds, vermiform kaolinite	154
784.5	784.8	0.3	sandy mudstone, medium dark gray N4, coarse-grained, quartz, subangular, moderately well sorted, poorly consolidated	155
784.8	785.5	0.7	lignite, grayish black N2, moderately well sorted, laminations	
785.5	787.7	2.2	claystone, upper portion is dark gray N3, lower portion is medium bluish gray 5b 5/1, fining upwards sequence, well sorted	
787.7	788.8	1.1	silty mudstone, greenish gray 5G 6/1, silty mudstone, fining upwards, quartz and mica rich, moderately well sorted, subrounded grains	
788.8	789.5	0.7	core lost	
789.5	802.0	12.5	silty mudstone, silt-filled burrows common (2-4 cm), burrows at top of section are long, pale olive 10Y 6/2, weakly bedded to well bedded in some areas, thin coal laminations and plant material located on the spit-face of the core, small coal bed at 791.5 (approx. 1 cm), 156-159	
802	802.2	0.2	sandstone, very fine grained, medium light gray N6	
802.2	805.9	3.7	silty mudstone	
805.9	807.7	1.8	claystone, medium dark gray N4, occasional light gray silt blebs (~0.05')	160
807.7	808.6	0.9	mudstone, fine organic laminae, grayish black N2	
808.6	814.6	6.0	claystone, grayish black N2 to medium dark gray N4. At 810.7, color shifts to dark gray N2 to black N1, laminated in layers (1 cm)	161
814.6	815.6	1.0	core lost	
815.6	816.2	0.6	sandy mudstone, medium dark gray N4, massive, poorly consolidated, mixed with drilling mud	162
816.2	817.9	1.7	mudstone, grayish black N2, well sorted, organic-rich laminations, woody material	
817.9	818.4	0.5	sandy mudstone, medium dark gray N4, mixture of mudstone and drilling mud	
818.4	818.7	0.3	mudstone, medium dark gray N4, well sorted	
818.7	818.8	0.1	core lost	
818.8	820.3	1.5	sandstone, medium dark gray N4, coarse sand granules in a mud matrix, some quartz and rounded bits of mud and/or shale, fining upwards	163
820.3	820.4	0.1	mudstone, dark gray N3 to grayish black N2	
820.4	820.5	0.1	tonstein, coarse grained 3/4" parting, sharp boundaries with surrounding mudstone, subangular clay granules and pebbles	
820.5	821.7	1.2	mudstone, dark gray N3 to grayish black N2, organic rich laminations	
821.7	822.3	0.6	lignite, black N1, intermixed drilling mud	

822.3	826.8	4.5	claystone, medium dark gray N5 to dark gray N4, slickensides present, organics, well sorted, massive	164
826.8	829.5	2.7	core lost	
829.5	830.6	1.1	silty mudstone, dark gray N3, fine laminations, thin organic layers	165
830.6	830.9	0.3	sandy mudstone, dark gray N3, mixture of drilling mud and coarse to granule size sand with fragments of silty mudstone	
830.9	831.7	0.8	drilling mud	166
831.7	833.6	1.9	claystone, dark gray N3, well sorted with some fine sand and silt lenses, laminated, possible leaves, a few clay-rich blebs	
833.6	835.1	1.5	lignite, black N1, contains thin light brownish gray 5YR 6/1 laminations, well sorted	
835.1	835.5	0.4	claystone, dark gray N3, well sorted, some thin laminations (<0.25 cm)	
835.5	839.2	3.7	silty mudstone, dark gray N3, fine laminations, well sorted, thin organic layers, poorly consolidated	167
839.2	839.5	0.3	core lost	
839.5	843.2	3.7	claystone, fissile, well bedded, organic rich laminations, rip up clasts, tonstein layers	168
843.2	844.5	1.3	silty mudstone, interbedded with small layers of tonstein and organic rich layers, rip-up clasts, slickensides	
844.5	844.6	0.1	claystone	169
844.6	844.8	0.2	sandstone, fine grained, long burrow ~6cm, roots	
844.8	847.7	2.9	claystone, dark gray N3, slickensides, small layers of siltstone, and organics	
847.7	849.5	1.8	sandstone, medium light gray N6, fine sand, well sorted, quartz rich, organic root traces, burrows, bedded	
849.5	850.5	1.0	drilling mud	170
850.5	854.5	4.0	sandstone, medium dark gray N4, very fine and fine sand, well sorted, wavy horizontal bedding, small layers of tonstein within section, organic root traces cut through bedding, fossil leaves	
854.5	854.6	0.1	silty mudstone	171
854.6	856.1	1.5	sandstone, fine sand, quartz rich, coarsening upwards slightly	
856.1	856.9	0.8	siltstone, well developed horizontal and wavy bedding, horizontal burrow filled with fine sand	
856.9	857.0	0.1	claystone, carbonate cement	
857	857.9	0.9	siltstone, well developed horizontal and wavy bedding	
857.9	858.0	0.1	claystone, carbonate cement	
858	858.5	0.5	siltstone, well developed horizontal and wavy bedding	
858.5	859.5	1.0	core lost	
859.5	860.9	1.4	siltstone, well developed horizontal and wavy bedding	172
860.9	861.5	0.6	claystone, dark gray N3, organic rich, unconsolidated	
861.5	861.9	0.4	siltstone, medium light gray N6	
861.85	864.0	2.1	siltstone, laminated, dark gray N3, organic rich	
864	864.3	0.3	claystone, dark gray N3	173
864.3	868.0	3.7	core lost	

868	868.2	0.1	sandstone, very fine sand	174
868.2	868.8	0.6	siltstone, horizontal bedding, slickensides	
868.8	871.5	2.7	sandstone, very fine sand, organic root traces, bedding destroyed by bioturbation	
871.5	872.2	0.7	siltstone, medium dark gray N4	175
872.2	873.0	0.8	core lost	
873	873.2	0.2	siltstone, medium dark gray N4	
873.2	873.5	0.3	core lost	
873.5	875.0	1.5	claystone, top 0.4' ripped up from drilling, medium gray N5, horizontal bedding, fissile	176
875	876.9	1.9	siltstone, interbedded layers, white blebs or horizontal burrows	
876.9	877.1	0.2	claystone	
877.1	877.3	0.2	sandstone, fine sand	
877.3	878.5	1.2	siltstone, horizontal bedding, burrows and bioturbation, tonstein, brown blebs	
878.5	880.0	1.5	core lost	177
880	881.6	1.5	claystone, fining upwards, horizontal and wavy bedding, fissile, slickensides	
881.55	883.2	1.7	siltstone, well laminated wavy bedding, organic material - quantity fining upwards, bioturbation, lignite layer interlaminated at 882.7'	
883.2	883.5	0.3	core lost	
883.5	886.6	3.1	siltstone, light gray N7, interlaminated, slickensides, organic material, root traces disrupting bedding	178
886.6	887.2	0.6	sandstone, fine grained clean sand	
887.2	887.8	0.6	siltstone	179
887.8	890.5	2.7	mudstone, light gray N7, coarsening upwards sequence, organics within layer	
890.5	893.2	2.7	core lost	
893.2	895.5	2.3	siltstone, some organic material, bioturbated, brown fine sandstone clasts	180
895.5	900.2	4.7	silty mudstone, chaotic bedding, hard yellow clasts - clay banding in middle and bottom, organics	181
900.2	901.5	1.3	core lost	
901.5	902.3	0.8	siltstone, medium light gray N6	182
902.3	902.8	0.5	sandstone, interbedded with siltstone, very fine sand, fining upwards, poorly sorted, wavy bedding,	
902.8	905.0	2.2	lignite, grayish black N2, tonstein layers, thin clay layers	
905	905.6	0.6	drilling mud	183
905.6	905.8	0.2	lignite grayish black N2, tonstein layer	
905.8	906.9	1.1	sandstone, medium dark gray N4, medium sands, coarsening upwards, bedding disturbed by roots	
906.9	908.1	1.2	silty sandstone, medium light gray N6, wavy bedding	
908.1	910.3	2.2	claystone, medium dark gray N4, slickensides, organic material	184
910.3	911.7	1.4	siltstone, medium light gray N6, some bedding, roots, bioturbation	
911.7	911.8	0.1	sandstone, medium gray N5, fine sand, bedding	
911.8	914.5	2.7	core lost	

914.5	917.5	3.0	sandstone, fine sand, horizontally wavy bedding, organic laminations, medium sorted, tonstein in middle,	185
917.5	919.5	2.0	core lost	186
919.5	919.9	0.4	drilling mud	
919.9	920.6	0.7	sandstone, medium light gray N6 to medium gray N5, fining upward fine sand to silty mudstone organics	
920.6	921.8	1.2	silty mudstone, dark gray N3 to grayish black N2, parallel bedding, organic rich at base, roots, slickensides,	
921.8	922.1	0.3	silty mudstone, medium gray N5 - some pinkish areas, layers of tonsteins and organics	
922.1	922.7	0.6	lignite, black N1, tonstein layers	
922.7	923.0	0.3	silty mudstone, medium gray N5, slickensides, organics	187
923	924.4	1.4	drilling mud	
924.4	925.6	1.2	silty mudstone, medium gray N5 to medium bluish-gray 5B 5/1, silty mudstone, thin light colored bands	
925.6	926.1	0.5	silty mudstone, medium dark gray N4, contains drilling mud	188
926.1	927.8	1.7	sandstone, medium gray N5 to medium dark gray N4, fine to very fine sand, well sorted, angular to rounded, quartz and mica rich, organic debris along bedding planes, slight cross-bedding	
927.8	928.0	0.2	core lost	
928	930.6	2.6	drilling mud	189
930.6	932.0	1.4	silty mudstone, medium gray N5 to grayish black N2, fine parallel laminae, contorted bedding, horizontal tubules	
932	933.2	1.2	core lost	
933.2	935.4	2.2	silty mudstone, medium gray N5 to dark gray N3 some laminations, organics throughout, slickensides near bottom, color at bottom: grayish black N2	190
935.4	936.5	1.1	core lost	
936.5	941.5	5.0	silty mudstone, medium light gray N6 to grayish black N2 - lightens downward, alternating light/dark thin laminations in top becoming mottled, organics throughout, slickensides	191
941.5	944.7	3.2	mudstone, medium light gray N6, bedding with organics, some layers of coarser sediment, poorly sorted, quartz and mica rich	192
944.7	945.0	0.3	silty mudstone, medium dark gray N4, v fine sand at base, organics throughout	
945	947.7	2.7	silty mudstone, medium gray N5 to dark gray N5 with thin horizontal lenticular blotches of yellowish gray 5Y 7/2, thin slices of lignite matter at various orientations on internal surfaces, laminated	193
947.7	949.4	1.7	muddy sandstone, medium gray N5, muddy, fine grained, with thin, irregularly spaced, horizontal lignitic laminations	
949.4	950.0	0.6	core lost	
950	951.5	1.5	sandstone, fine grained, small organic laminations, poorly sorted, horizontal bedding, visible lenses of muddy sandstone	194
951.5	952.6	1.1	siltstone, small sandstone and clay-rich laminations	
952.6	954.5	1.9	lignite, some minor silty layers intermingled for 0.8', tonstein observed	

954.5	956.0	1.5	lignite, interbedded with silts and claystone (nice layers), grayish black 2N2	195
956	957.3	1.3	silty mudstone, organic root traces, light gray N6 to medium light gray N7, interbedded with small layer of sandy mudstone followed by organic rich claystone	
957.3	959.6	2.3	siltstone, horizontal and wavy bedding, organic root traces abundant	
959.6	962.5	2.9	silty mudstone, interbedded silt, sand and clay, small wavy laminations, some organic material, fine sand layer, some small horizontal burrows at 960.0, lignite and organics at end.	196
962.5	965.2	2.7	silty mudstone, medium gray N5, organic rich, lignite seams, wavy bedding, clay clast 2.5 cm, organic material, bioturbated,	197
965.2	965.5	0.3	lignite, black N1	
965.5	965.9	0.4	claystone	
965.9	966.4	0.5	core lost	
966.4	967.5	1.1	siltstone, medium gray N5 bedding evident, but likely some bioturbation,	
967.5	968.4	0.9	siltstone, medium dark gray N4, nice bedding, burrows,	198
968.4	970.0	1.6	sandstone, very light gray N8, to light gray N7, fine grained, very consolidated, nice horizontal bedding, horizontal burrows which have been filled with calcite and a claystone lens which intersects the burrows	
970	972.5	2.5	muddy sandstone, medium dark gray N4, silty, muddy sandstone with some clay rich laminations and organics, some bedding observed, slightly fining upwards	
972.5	973.5	1.0	sandstone, very fine grained, medium light gray N6	199
973.5	973.6	0.1	claystone, light yellow clay band, potentially bentonite or carbonaceous claystone bands.	
973.6	974.6	1.0	muddy sandstone, fine grained, interlaminated with organic material	
974.6	974.7	0.1	claystone, light yellow clay bands	
974.7	977.5	2.8	sandstone, fine-medium grained, medium gray N5, some silt, organic rich laminations, horizontal and wavy laminations	
977.5	978.0	0.5	muddy sandstone, lt. gray N7, organic rich laminae,	200
978	980.5	2.5	sandstone, lt. gray N7, fine grained, quartz rich fines upwards, black organic stringers in middle	
980.5	980.6	0.1	mudstone, med. lt. gray N6	
980.6	981.3	0.7	siltstone, med. lt. gray N6-med. gray N5, weakly laminated	
981.3	982.2	0.9	muddy sandstone, yellowish gray 5Y 7/2, fine grained, laminated, fining upwards, organic rich stringers	
982.2	982.5	0.3	core lost	
982.5	983.5	1.0	sandstone, med. gray N6 very fine grained, , cross-bedded, climbing ripples	201
983.5	984.4	0.9	silty mudstone, med. dark gray N4, horizontal and wavy bedding with organic layers, bioturbation	
984.4	984.5	0.1	sandstone, fine grained	
984.5	984.7	0.2	siltstone	
984.7	985.2	0.5	lignite, grayish black N2	

985.2	986.3	1.1	core lost	
986.3	990.3	4.0	lignite, black N1 with sandy or tonstein partings about 0.1' thick each	202
990.3	991.0	0.7	claystone	
991	991.3	0.3	core lost	
991.3	992.0	0.7	claystone	203
992	995.5	3.5	lignite, pyrite nodule at 992.3, sand stringer at 992.5	
995.5	997.0	1.5	muddy sandstone, massive, organic rich, fining upwards, pyrite at 995.7, olive gray 5Y 3/2	204
997	1000.0	3.0	sandstone, fine-grained, massive, fining upwards, sulfide nodules at 997.5-999.5, lt. olive gray 5Y 5/2, rare feldspars degrading to clay	
1000	1000.2	0.2	claystone, lt. gray N7	205
1000.2	1002.0	1.8	sandstone, lt. gray N6, very fine, well-sorted	
1002	1005.0	3.0	sandstone, med. dark. gray N4, fining upwards to claystone	
1005	1005.9	0.9	claystone, slightly silty interbeds, med. dark. gray N4	206
1005.9	1007.1	1.2	sandstone, med. gray N5, fine-grained, fining upwards, wavy laminations	
1007.1	1008.2	1.1	sandstone, med. gray N5, coarse grained, mod. well-sorted, horizontal laminations	
1008.2	1008.5	0.3	lignite, one claystone parting	
1008.5	1009.2	0.7	muddy sandstone, grayish green 10GY 5/2, extensive bioturbation and soft sediment deformation	207
1009.2	1011.8	2.6	silty mudstone, grayish olive 10Y 4/2, slickensides, mottles, fining upward	
1011.8	1012.5	0.7	sandstone, grayish olive 10Y 4/2, soft sediment deformation,	
1012.5	1014.5	2.0	silty mudstone, dusky yellow green 5GY 5/2 to grayish olive green 5GY, massive	208
1014.5	1015.3	0.8	mudstone, med. dark gray N4	
1015.3	1016.7	1.4	lignite, some slickensides	
1016.7	1017.4	0.7	silty mudstone, med. gray N5, laminated, some burrows, slickensides	
1017.4	1018.5	1.1	sandstone, burrowed	
1018.5	1019.1	0.6	claystone, burrowed	209
1019.1	1019.7	0.6	mudstone, interbeds with large nodules (up to 8 cm)	
1019.7	1020.5	0.8	lignite, grayish black N2, slickensides, some pyrite, minor clay interbeds,	
1020.5	1021.3	0.8	sandstone, medium lt. gray N6, poorly sorted, angular,	
1021.3	1022.8	1.5	nodule, very lt. gray N8	
1022.8	1026.8	4.0	sandstone, medium gray 5/N5, fine-medium grained, some clay	210
1026.8	1027.0	0.2	core lost	
1027	1027.9	0.8	lignite, slickensides and pyrite	211
1027.8	1032.0	4.2	claystone, slickensides, burrow at 1029.9, carbonate cementation at 031-1032	
1032	1032.6	0.6	silty mudstone, dark gray N3	212
1032.6	1033.8	1.2	silty mudstone, med. lt. gray N5, whitish blebs and convolute bedding	
1033.8	1034.6	0.8	silty mudstone, dark gray N3 to medium dark. gray N4, slickensides throughout with organic debris on bedding planes	

1034.6	1034.7	0.1	core lost	213
1034.7	1036.1	1.4	sandstone, very fine grained, micaceous, med. dark. gray N4 to med. lt. gray N6, bioturbated	
1036.1	1039.4	3.3	silty mudstone, grayish black N2, lightening upwards to med. dark. gray N4, slickensides throughout	
1039.4	1040.1	0.7	drilling mud	214
1040.1	1043.0	2.9	silty mudstone, med. lt. gray N6 with patches of med. dark. gray N4, convolute bedding	
1043	1044.0	1.0	silty mudstone, med. dark. gray N4, with slickensides, fining upwards	
1044	1048.8	4.8	sandstone, lt. gray N7 to dark gray N3, very fine grained, micaceous, cross-bedding at 1045.5, clay lens at 1047.5	215
1048.8	1049.0	0.2	core lost	
1049	1049.2	0.2	sandstone, dark gray N3 to med. gray N5, fine to med. grained, micaceous	216
1049.2	1049.3	0.1	claystone, with lignite fragments	
1049.3	1054.0	4.7	sandstone, dark gray N3 to med. gray N5, fine to med. grained, micaceous	
1054	1054.7	0.7	muddy sandstone, med. dark. gray N4, organic laminations, poorly sorted	
		217		
1054.7	1054.8	0.1	sandstone, med. lt. gray N6, med. grained	
1054.8	1055.5	0.7	muddy sandstone, med. dark. gray N4, organic laminations, poorly sorted, leaf fossil at 1055.3	
1055.5	1056.7	1.2	sandstone, lt. gray N7-very lt. gray N8, med. to coarse, massive, poorly sorted, some organics, angular to rounded	
1056.7	1059.2	2.5	core lost	
1059.2	1060.8	1.6	sandstone, lt. gray N7 to dark gray N3, fine-coarse grained, massive, subrounded to subangular, minor mica, intermittent thin lignites	218
1060.8	1061.0	0.2	sandstone, coarse grained and bounded by lignitic layers	
1061	1062.1	1.1	sandstone, coarse grained, light gray N7 to dark gray N3, massive, subrounded to subangular, minor mica, intermittent thin lignites	
1062.1	1062.3	0.2	lignite	
1062.3	1063.3	1.0	sandstone, medium grained	
1063.3	1063.8	0.5	sandstone, grayish black N2- grayish olive green 5GY 3/2, very coarse grained, poorly sorted, with kaolinite blebs,	219
1063.8	1067.3	3.5	core lost	
1067.3	1067.6	0.3	sandstone, med. gray N5, medium grained	220
1067.6	1069.3	1.7	silty mudstone, med. dark. gray	
1069.3	1069.8	0.5	muddy sandstone, med. gray N6, mixed with drilling mud	
1069.8	1072.3	2.5	muddy sandstone, med. dark. gray N4, horizontal bedding planes, soft sediment deformation	
1072.3	1072.8	0.5	silty mudstone, med. dark. gray N4, mixed with drilling mud	221
1072.8	1073.9	1.1	mudstone, med. dark. gray N4 to grayish black N2, fining upwards from fine sand, leaf fossils	
1073.9	1076.3	2.4	muddy sandstone, med. gray N5, fine grained, coarsening upwards	
1076.3	1076.5	0.2	sandy mudstone, med. dark. gray N4	222

1076.5	1079.8	3.3	silty mudstone, dark. gray N3	223
1079.8	1080.0	0.2	sandy mudstone, greenish gray 5GY 6/1, moderately well sorted	
1080	1081.1	1.1	silty mudstone, med. bluish gray 5B 5/1 silty mudstone and greenish gray 5GY 6/1 alternating beds, soft sediment. deformation, burrows	
1081.1	1083.0	1.9	silty mudstone, med. bluish gray 5B 5/1	
1083	1084.5	1.5	silty mudstone, lt. gray, chaotic bedding in places	224
1084.5	1084.6	0.1	mudstone	
1084.6	1086.5	1.9	siltstone, lt. gray, roots	
1086.5	1087.5	1.0	sandy mudstone, med. lt. gray, moderately well-sorted, soft sediment deformation	225
1087.5	1089.7	2.2	silty mudstone, med. bluish gray 5B 5/1	
1089.7	1090.4	0.7	mudstone	
1090.4	1091.6	1.2	lignite, black N1	
1091.6	1092.2	0.6	sandy mudstone, very fine grained with interbedded silt	226
1092.2	1094.7	2.5	claystone, horizontal bedding, roots	
1094.7	1095.7	1.0	siltstone, soft sediment deformation	
1095.7	1095.9	0.2	claystone	
1095.9	1096.5	0.6	core lost	
1096.5	1097.4	0.9	siltstone, med. dark. gray N4, with thin lignites	227
1097.4	1098.4	1.0	sandy mudstone	
1098.4	1101.0	2.6	core lost	
1101	1102.8	1.8	silty mudstone, med. light gray N6 to med. gray N5, horizontal laminations, slickensides at base	228
1102.8	1104.1	1.3	siltstone, med. dark. gray N4	229
1104.1	1105.2	1.1	sandy mudstone, med. lt. gray N6, very fine grained, granules at 1104.6	
1105.2	1107.4	2.2	silty mudstone, grayish black N2, med. dark. gray, thinly bedded	
1107.4	1107.5	0.1	lignite	
1107.5	1108.6	1.1	claystone, dark. gray N3, slickensides, rip up clasts (2-5cm) from 1107.5 to 1107.9	230
1108.6	1108.7	0.1	lignite, brownish black 5YR 2/1	
1108.7	1112.0	3.3	claystone, dark. gray N3, grayish black N2 at base, 0.1' sand at 1111.5	
1112	1119.1	7.1	silty mudstone, med. dark. gray N4, floating lignite clasts, slickensides	231 232
1119.1	1119.7	0.6	sandy mudstone, dark. gray N3	
1119.7	1120.2	0.5	core lost	
1120.2	1120.8	0.6	silty mudstone, greenish gray 5GY 6/1, slickensides, convolute bedding	233
1120.8	1124.0	3.2	claystone, greenish gray 5GY 6/1 and very pale orange 10YR 8/2	
1124	1125.0	1.0	mudstone, grayish brown 5YR 3/2, slickensides	
1125	1126.7	1.7	sandy mudstone, med. gray N5 to med. N6, root traces, sand-filled burrows	234
1126.7	1127.3	0.6	silty mudstone, med. light gray N6	
1127.3	1127.6	0.3	lignite, with tonsteins	
1127.6	1130.0	2.4	silty mudstone, grayish black N2, fissile	

1130	1130.9	0.9	lignite	235
1130.9	1131.0	0.1	mudstone, brownish gray 5YR 4/1	
1131	1132.0	1.0	silty mudstone, med. gray N5	
1132	1132.9	0.9	silty mudstone, grayish black N2	236
1132.9	1134.2	1.3	siltstone, med. dark gray N4 with med. gray N5, bioturbated	
1134.2	1135.0	0.8	siltstone, med. dark gray N4 with med. gray N5 laminations, layers very thin and horizontal	
1135	1135.6	0.6	siltstone, med. gray N5 with distorted laminations, laminations	
1135.6	1135.7	0.1	claystone, dark. gray N3, finely laminated	
1135.7	1136.2	0.5	claystone/siltstone, interbedded dark. gray N3 claystone and medium dark gray N4 silty mudstone	
1136.2	1137.4	1.2	claystone, grayish black N2, silty at base	237
1137.4	1138.8	1.4	siltstone, med. dark. gray N4	
1138.8	1141.2	2.4	silty mudstone, med. gray N5	
1141.2	1143.0	1.8	siltstone, med. gray N5	238
1143	1143.5	0.5	silty mudstone, med. dark. gray N4	
1143.5	1143.8	0.3	mudstone	
1143.8	1143.9	0.0	lignite	
1143.8	1144.5	0.7	claystone, med. dark. gray N4	
1144.5	1146.0	1.5	sandstone, interbedded laminations, N4 to N2	
1146	1146.4	0.4	siltstone, med. gray N5	239
1146.4	1147.4	1.0	silty mudstone, med. gray N5	
1147.4	1148.1	0.7	sandy mudstone, med. gray N5	
1148.1	1149.3	1.2	silty mudstone, med. gray N5	
1149.3	1152.3	3.0	mudstone, lignitic	240
1152.3	1152.7	0.4	claystone, med. dark. gray N4	
1152.7	1155.5	2.8	silty mudstone, medium dark gray N4, slickensides, fines up, laminated, scant organic matter	241
1155.5	1156.9	1.4	silty mudstone, medium gray N5, horizontally laminated with light gray N7, some disturbed laminations, indurated, very silty, some very fine laminations	
1156.9	1157.4	0.5	silty mudstone, dark gray N3, organic material throughout, vaguely laminated, slightly silty, slickensides	
1157.4	1158.3	0.9	silty mudstone, grayish black N2, very faint lamination, fining up	242
1158.3	1159.2	0.9	siltstone, grayish black N2, a few small lenses of black carbonaceous material	
1159.2	1159.6	0.4	sandy mudstone, dark greenish gray 5G, very fine sand with quartz and biotite grains	
1159.6	1160.1	0.5	silty mudstone, dark gray N3	
1160.1	1160.2	0.1	siltstone, medium dark gray N4, mottled	
1160.2	1160.6	0.4	silty mudstone, dark gray N3	
1160.6	1161.0	0.4	siltstone, dark greenish gray 5G, finely laminated	
1161	1161.1	0.1	sandy mudstone, brownish gray 5YR	
1161.1	1161.3	0.2	siltstone, dark greenish gray 5G, finely laminated	
1161.3	1163.3	2.0	siltstone, medium dark gray N4, laminated with darker material, some organics with larger reworked clay clasts	243

1163.3	1165.7	2.4	sandstone, medium light gray N6, very fine grained, fining upwards, sharp contact, quartz and mica rich, subrounded, finely laminated	
1165.7	1170.8	5.1	sandstone, medium gray N5, medium grained, grading into sandy mudstone, quartz rich with some biotite and feldspar	244
1170.8	1175.8	5.0	sandstone, medium light gray N6, medium-fine grained, quartz and mica rich, rounded, coarsening upwards, poorly sorted, black organic laminations, large burrow located between 1171-1172	245
1180.8	1185.8	5.0	sandstone, medium bluish gray 5B 5/1, fine-medium grained, quartz rich, rounded grains, well sorted, massive, thin organics	247
1185.8	1192.3	6.5	sandstone, medium light gray N6, fine grained, quartz rich with dark, non-micaceous grains, subangular-subrounded, massive, moderately well sorted	248
1192.3	1195.0	2.7	sandy mudstone, medium light gray N6 with medium dark gray N4 clay bands, fine sandstone, micaceous, quartz, 1192.3-1193 finely laminated alternately lighter and darker sands	
1195	1198.6	3.6	sandstone, interlaminated dark gray N3 muddy sandstone and medium light gray N6 sandstone, fining upwards from fine sand to greater proportion of silt/mud, moderately well sorted, quartz, rounded grains, evidence of laminations, burrow and soft sediment deformation	250
1198.6	1199.7	1.1	sandstone, medium gray N5, fining upwards, quartz, some mica and hornblende, rounded grains, well sorted, massive, indurated	
1199.7	1200.6	0.9	sandstone, medium gray N5, fining upwards, quartz, rounded grains, well sorted, some laminations and low-angle crossbeds	251
1200.6	1200.8	0.2	core lost	
1200.8	1202.6	1.8	sandstone, grayish blue green 5BG 5/2 at base grading to medium light gray N6 at top of unit, fining upwards from coarse to medium sands, arkosic with lots of quartz and kaolinitized feldspars, rounded grains, well sorted, 30-45 degree crossbeds	
1202.6	1205.0	2.4	sandy mudstone, dark gray N3 silty mudstone and light gray N7 sandy mudstone, poorly developed interbeds between two lithologies in basal portion of unit, sandy mudstone exists as 40mm blebs, moderately well sorted, some thin fine sand laminations, slickensides	
1205	1209.2	4.2	muddy sandstone, muddy, fine grained, quartz, micaceous, subangular, light gray N7 to medium light gray N6, occasional granule-sized claystone clasts, band of 2mm long dark organic flecks and stringers between 1205.5-1205.8	252
1209.2	1213.0	3.8	silty mudstone, medium bluish gray 5B 5/1, moderately well sorted, some thin laminations, finer material infills, root traces or burrows	253
1213	1214.2	1.2	silty mudstone, medium gray N5, fining upwards, moderately well sorted, thin laminations	
1214.2	1218.0	3.8	sandstone, very fine grained, dark greenish gray 5GY 4/1, with minor amounts of mica and dark, non-micaceous minerals, subrounded to subangular, moderately well sorted, dark mineral concentrations along planar to high angle crossbeds	254

1218	1218.5	0.5	silty mudstone, dark gray N3, fining upwards, moderately well sorted, organic fragments (20 mm), possible burrows	255
1218.5	1219.1	0.6	muddy sandstone, dark greenish gray 5G 4/1, moderately well sorted, fine quartz and low angle crossbeds	
1219.1	1219.6	0.5	core lost	
1219.6	1220.4	0.8	sandy mudstone, medium light gray N6, moderately well sorted, fine sand and silt, 1219.8 soft sediment deformation features, indurated, some mudstone blebs	
1220.4	1223.0	2.6	silty mudstone, medium gray N5, fining upwards, well sorted, thin laminations in lower 2" of unit, slickensides	
1223	1225.4	2.4	silty mudstone, dark gray N3 to medium dark gray N4, fining upwards, moderately well sorted, woody material, slickensides	256
1225.4	1226.4	1.0	sandy mudstone, light bluish gray 5B7/1, massive, small burrows, fining upwards from fine sand to silt, moderately well sorted	
1226.4	1227.8	1.4	sandy mudstone, medium dark gray N4, mottled appearance, poorly developed interbeds, some blocky fracture	
1227.8	1228.0	0.2	muddy sandstone, muddy, silty, very fine grained, dark greenish gray 5G4/1, less well cemented between 1227.8 and 1228 than below	257
1228	1229.4	1.4	muddy sandstone, dark greenish gray 5G 4/1, very fine sandy mudstone, interspersed with muddy, silty fine grained sandstone	
1229.4	1230.0	0.6	core lost	
1230	1232.0	2.0	silty mudstone, dark.. greenish gray 5G 4/1	258
1232	1232.6	0.6	sandstone, med. dark. gray N4, fine-grained, poorly sorted, arkosic, massive	
1232.6	1233.6	1.0	silty mudstone, dark gray N3, laminated at top, convolute at base	
1233.6	1235.0	1.4	muddy sandstone, very fine-grained, dark. gray N3, poorly sorted, massive	
1235	1235.4	0.4	sandstone, grayish green 10G 4/2	259
1235.4	1235.9	0.5	silty mudstone, lt. bluish gray 5B 4/2, poorly sorted, rooted	
1235.9	1237.0	1.1	muddy sandstone, med. gray N5, fine-grained, rounded-sub-rounded, arkosic, rooted, massive	
1237	1238.8	1.8	silty mudstone, medium gray N5, coarsening upwards, burrows, thin layers of carbonaceous mudstone	
1238.8	1239.4	0.6	muddy sandstone, med. gray N5, very fine-grained, poorly sorted, subangular, arkosic, rooted, massive	
1239.4	1240.0	0.6	silty mudstone, med. bluish gray 5B 5/1, wavy bedding	
1240	1241.2	1.2	muddy sandstone, med. gray N5, very fine-grained, poorly sorted	260
1241.2	1243.3	2.1	silty mudstone, med. gray N5, prominent burrows between 1242.0 and 1242.8, wavy bedding at base	
1243.3	1243.5	0.2	muddy sandstone, med. gray N5, very fine-grained, poorly sorted	
1243.5	1244.7	1.2	siltstone, med. gray N5 to lt. brownish gray 5YR 6/1, convolute bedding	
1244.7	1245.0	0.3	core lost	

1245	1245.7	0.7	sandy mudstone, dusky green 5G 3/2, very fine	261
1245.7	1245.8	0.1	muddy sandstone, med. dark. gray N4, v. fine-grained	
1245.8	1246.1	0.3	silty mudstone, very light gray N8 and med. gray N5	
1246.1	1246.5	0.4	muddy sandstone, med. dark. gray N4, v. fine-grained	
1246.5	1247.5	1.0	silty mudstone, very light gray N8 and med. gray N5	
1247.5	1248.2	0.7	muddy sandstone, med. dark. gray N4, v. fine-grained, disturbed bedding	
1248.2	1248.4	0.2	silty mudstone, very light gray N8 and med. gray N5	
1248.4	1249.0	0.6	muddy sandstone, med. dark. gray N4, v. fine-grained, disturbed bedding	
1249	1249.2	0.2	silty mudstone, very light gray N8 and med. gray N5	
1249.2	1250.0	0.8	core lost	
1250	1250.2	0.2	muddy sandstone, very fine grained sand	262
1250.2	1251.9	1.7	silty mudstone, med. dark. gray N4, finely bedded at top	
1251.9	1252.8	0.9	claystone, dark.. gray N3, massive	
1252.8	1257.4	4.6	silty mudstone, med. gray N5	263
1257.4	1257.5	0.1	muddy sandstone, med. gray N5, very fine grained, poorly sorted, subangular, massive	
1257.5	1262.1	4.6	silty mudstone, med. gray N5 to dark gray N3, some slickensides	264
1262.1	1263.2	1.1	sandstone, very fine grained, quartz	
1263.2	1271.6	8.4	silty mudstone, med. gray N5 with light gray N7 laminations, soft sediment deformation, some slickensides, convolute at 1265, 1269, and 1271 feet	265-266
1271.6	1271.8	0.2	muddy sandstone, very fine grained, quartz, finely laminated	267
1271.8	1272.7	0.9	silty mudstone, med. gray N5	
1272.7	1273.8	1.1	muddy sandstone, very fine grained, quartz, finely laminated	
1273.8	1274.6	0.8	silty mudstone, med. gray N5	
1274.6	1275.1	0.5	muddy sandstone, very fine grained, quartz, finely laminated	
1275.1	1277.0	1.9	muddy sandstone, light olive gray 5Y 6/1 sandstone alternating with layers of siltstone in horizontal and convoluted layers at 1275.7	
1277	1277.1	0.1	sandstone, clay intraclasts	
1277.1	1282.1	5.0	sandstone, greenish gray 5G 6/1 medium to fine-grained quartz, moderately well-sorted, fining upwards, large clay blebs at top, intraclasts	268
1282.1	1287.2	5.1	sandstone, lt. bluish gray 5B 7/1, fine-grained, subangular to subrounded, moderately well-sorted, kaolinitized feldspars, arkosic	269
1287.2	1287.8	0.6	muddy sandstone, med. bluish gray 5B 5/1, fine-medium grained arkosic, mod. well-sorted, fining upwards, with bands of dark organics and green clays	270
1287.8	1288.2	0.4	muddy sandstone, dusky green 5G 3/2, coarse sand in muddy matrix, white N9, moderate reddish orange 10R 6/6, clay pebble clasts	
1288.2	1288.6	0.4	muddy sandstone, coarse sand in muddy matrix	
1288.6	1289.0	0.4	muddy sandstone, coarse to very coarse sand in muddy matrix, clay pebble clasts, bimodal sorting	

1289	1293.6	4.6	muddy sandstone, grayish green 10GY 5/2, medium-coarse sand in muddy matrix, occasional. rip-ups,	271
1293.6	1293.9	0.3	sandstone, lt. bluish gray 5B7/1, medium-grained arkosic, quartz	
1293.9	1294.7	0.8	muddy sandstone, lt. bluish gray 5B7/1, fine-grained arkosic, fining upwards	
1294.7	1295.1	0.4	muddy sandstone, coarse grained sand and pebble-sized clay clasts	
1295.1	1296.1	1.0	drilling mud	
1296.1	1297.5	1.4	silty mudstone, N6 to N4, some slickensides	272
1297.5	1299.9	2.4	siltstone, zones of fine laminations and disturbed zones	
1299.9	1301.1	1.2	silty mudstone, mottled lt. gray N7 to med. dark. gray N4, minor slickensides	
1301.1	1302.0	0.9	silty mudstone, medium gray N5 to medium dark gray N4, very fine sand	273
1302	1303.6	1.6	silty mudstone, medium gray N5 to medium dark gray N4, slickensides	
1303.6	1304.1	0.5	core lost	
1304.1	1304.9	0.8	sandstone, dark gray N3, v fine sand	274
1304.9	1306.6	1.7	sandy mudstone, medium gray N5 to medium dark gray N4, with occasional light gray N6 blotches, fine sand, feldspar grains	
1306.6	1309.1	2.5	silty mudstone, medium gray N5, medium light gray N6, with light gray N7 blotching, very fine sand	
1309.1	1312.0	2.9	sandy mudstone, laminated dark gray N3 medium light gray N6 with gradational contacts, mod well sorted, some blebs, fine sand, rounded, quartz, thin laminations, soft sediment deformation	275
1312	1313.4	1.4	silty mudstone, medium light gray N6, horizontal laminations, some slickensides	276
1313.4	1314.9	1.5	siltstone, olive gray 5Y 4/1	
1314.9	1316.0	1.1	sandy mudstone, very fine sand, organics, bedding disturbed by roots or bioturbation, slickensides	
1316	1319.5	3.5	drilling mud	277
1319.5	1319.8	0.3	core lost	
1319.8	1320.4	0.6	siltstone, dark greenish-gray 5G 4/1,	
1320.4	1323.3	2.9	sandy mudstone, medium dark gray N4, fine laminae, disturbed inclined ripples and crossbeds	278
1323.3	1328.5	5.2	silty mudstone, greenish black 5GY 2/1, fine laminations	279
1328.5	1332.5	4.0	muddy sandstone, very light gray N8, fine to medium sand, fining upwards, organic matter disturbing bedding, occasional silty layers, intraclasts	280
1332.5	1332.7	0.2	sandy mudstone, medium gray N5, fine to medium sand	
1332.7	1332.9	0.2	muddy sandstone, very light gray N8, fine to medium sand, fining upwards, organic matter disturbing bedding, occasional silty layers, intraclasts	
1332.9	1333.4	0.5	sandy mudstone, medium gray N5, fine to medium sand	
1333.4	1333.5	0.1	core lost	
1333.5	1334.5	1.0	siltstone, fine laminae, bioturbated, fining upwards sequence	281
1334.5	1335.8	1.3	sandy mudstone, light gray N7, fining upwards sequence	

1335.8	1338.0	2.2	muddy sandstone, medium gray N3, fining upwards sequence, medium sand laminae	
1338	1338.5	0.5	silty mudstone	
1338.5	1339.7	1.2	core lost	
1339.7	1340.4	0.7	siltstone, dark gray N3	282
1340.4	1342.3	1.9	sandy mudstone, dark greenish gray 5G 4/1, occasional fine root traces, massive, fine sand, mica	
1342.3	1343.0	0.7	siltstone, greenish black 5G 2/1	
1343	1343.9	0.9	claystone, olive gray 5Y 4/1	
1343.9	1345.0	1.1	siltstone, dark greenish gray 5GY 4/1, disturbed fine laminae	
1345	1349.0	4.0	muddy sandstone, light olive gray 5Y 6/1, fine sand with silt laminations, wavy bedding, some horizontal and angular beds, heavy mineral streaks form bedding lines, slightly micaceous, intraclasts	283
1349	1349.3	0.3	core lost	
1349.3	1351.2	1.9	siltstone, greenish black 5G 2/1, fine horizontal laminae with organic matter up to one inch, cross-bedded	284
1351.2	1351.3	0.1	sandy mudstone, greenish gray	
1351.3	1353.3	2.0	sandy mudstone, fining upwards sequence, medium dark gray N4, slightly micaceous, slickensides	
1353.3	1355.3	2.0	sandy mudstone, medium light gray N6 to medium dark gray N4, very fine sand, some horizontal silt bands, micaceous quartz, organics, large clay intraclast	285
1355.3	1356.1	0.8	claystone, dark gray N3, extensive slickensides	286
1356.1	1359.9	3.8	silty mudstone, dark greenish gray 5GY 4/1 to medium bluish gray 5B 5/1, micaceous layers, organic rich layers with roots, burrows, intraclasts, extremely fine laminae in places	
1359.9	1362.1	2.2	silty mudstone, medium gray N5, fining upwards, fine sand laminations, slightly micaceous, kaolinitized feldspars, organics	287
1362.1	1363.0	0.9	silty mudstone, slickensides	
1363	1365.0	2.0	silty mudstone, medium dark gray N4, coarsens upwards, organic material	
1365	1366.8	1.8	silty mudstone, medium gray N5, no laminations, siltier downward, few areas with wavy laminations	288
1366.8	1369.6	2.8	silty mudstone, grayish black N2 and medium gray N5, fine laminations (1mm), bioturbated	
1369.6	1369.8	0.2	core lost	
1369.8	1370.1	0.3	silty mudstone, medium dark gray N4	
1370.1	1370.2	0.1	silty mudstone	
1370.2	1372.0	1.8	muddy sandstone, fining up, medium light gray N6, organic rootlets in top half, clay clasts to 10mm	
1372	1372.9	0.9	muddy sandstone, med. dark gray N4, fine grained,	
1372.9	1373.4	0.5	muddy sandstone, wavy laminations	
1373.4	1375.2	1.8	silty mudstone, grayish black N2, slightly silty, uniform layer, slickensides	290
1375.2	1377.0	1.8	sandy mudstone, dark gray N3, slightly silty, some bioturbation, slickensides, some patches of silty mudstone, fining up	

1377	1377.5	0.5	silty mudstone, medium gray N5, some fine sands, slight bioturbation	
1377.5	1380.4	2.9	silty mudstone, dark gray N3, uniform, some very fine sand, mostly silty, slickensides, fining upward, possible burrows	291
1380.4	1381.8	1.4	sandy mudstone, brownish black 5YR 2/1, organic matter throughout, fine sand grains and silt present, angular quartz and some gypsum crystals present	
1381.8	1383.2	1.4	silty mudstone, dark gray N3, micaceous	292
1383.2	1383.9	0.7	silty mudstone, medium gray N5-medium dark gray N4, micaceous, kaolinite and gypsum crystals, slickensides	
1383.9	1384.5	0.6	drilling mud	293
1384.5	1385.1	0.6	sandy mudstone, dark gray N3, fine grained sand within mudstone, small whitish specks	
1385.1	1386.1	1.0	sandy mudstone, light olive gray 5Y5/2, fine grain sand throughout, very small kaolinite specks, muscovite rich, some organics	
1386.1	1389.1	3.0	sandstone, medium gray N5, fine grained, very micaceous, quartz, massively bedded, fining upward from medium to fine	
1389.1	1394.0	4.9	sandstone, variable dark gray N3 - medium light gray N6, massively bedded, fining upwards, biotite and organic crossbedding at basal end	294
1394	1395.7	1.7	sandstone, medium light gray, N6, medium grains, fining upwards, very micaceous and quartz rich, some hornblende, subrounded grains, well sorted, massive	295
1395.7	1397.7	2.0	core lost	
1397.7	1399.0	1.3	silty mudstone, medium dark gray N4, well sorted, massive, slickensides	
1399	1401.0	2.0	silty mudstone, dark gray N3, very fine sand and silt, with faint greenish tinge, quartz and mica flecks	296
1401	1401.4	0.4	sandy mudstone, muddy silty, very fine sand, with thin interbeds of darker, finer grained sediments, crossbedding, mica flecks	
1401.4	1401.5	0.1	silty mudstone, dark gray N3 or medium dark gray N4	
1401.5	1406.1	4.6	silty mudstone, dark gray N3, well sorted, one fine grained sandstone patch at 1401.9-1402.0, blocky fracture, massive	297
1406.1	1410.6	4.5	silty mudstone, medium light gray N6 to medium dark gray N4, abundant tiny flecks of darker muddy sediments, at 1406.7 coarse-grained sand with amber clast	298
1410.6	1413.9	3.3	silty mudstone, dark gray N5-light gray N7, mottled, moderately well sorted	299
1413.9	1415.0	1.1	sandy mudstone, greenish gray 5G6/1 moderately well sorted, fine sand and mud, thin laminations	
1415	1415.6	0.6	silty mudstone, dark gray N3, silty mudstone, moderately well sorted, massive	
1415.6	1417.3	1.7	silty mudstone, grayish black N2	300
1417.3	1418.1	0.8	sandy mudstone, dark gray N3-light gray N7, fine sandy mudstone, blotchy, some thin organic strands	
1418.1	1419.6	1.5	silty mudstone, very light gray N8 to bluish white 5B9/1, occasional dark organic stringers up to 18mm in length	

1419.6	1420.1	0.5	core lost	
1420.1	1424.1	4.0	sandstone, olive gray 4/1, fissile, quartz, very fine sand, some thin elongated clay clasts floating throughout, one burrow	301
1424.1	1424.6	0.5	core lost	
1424.6	1424.8	0.2	drilling mud	
1424.8	1426.0	1.2	silty mudstone, med. dark. gray N4 silty mudstone interlaminated with very fine sandy mudstone, pale orange 10YR 7/4. soft sediment deformation, slightly micaceous	302
1426	1428.8	2.8	silty mudstone, brownish black 5YR 2/1 silty mudstone, very common thin lenses of floating lignite black N1, some larger coalified branch fragments	
1428.8	1429.4	0.6	core lost	
1429.4	1433.5	4.1	silty mudstone, med. light gray N6 silty mudstone, moderately well sorted, laminae at base of unit, abundant organic fragments- leaves and root traces, bioturbation	303
1433.5	1434.3	0.8	silty mudstone, dark. gray N3 silty mudstone, moderately well sorted, thin wavy laminae with organic fragments on bedding planes	
1434.3	1439.1	4.8	silty mudstone, dark greenish gray 5G 4/1, root trace at 1436, 1437.0-14.38.3 multiple episodes of soft sediment deformation, 1437.9-1437.7 rip up clasts	304
1439.1	1439.5	0.4	core lost	
1439.5	1441.6	2.1	silty mudstone, dark gray N3, fining upwards	305
1441.6	1442.3	0.7	muddy sandstone, dark greenish gray 5G 4/1, medium grained sands in muddy matrix with thin organic seams, grayish green 10G 4/2 and dark yellowish brown 10YR 5/4 clay intraclasts , very micaceous, angular grains	
1442.3	1449.1	6.8	core lost	
1449.1	1452.8	3.7	sandy mudstone, greenish gray 5G 6/1 mudstone with fine-very fine grained sands, areas with bedded grayish green 10G 4/2 clay intraclasts up to 3cm in length, some clay and sand laminations, disrupted fabric, bioturbation	306
1452.8	1456.2	3.4	muddy sandstone, grayish green 5G 5/2 fine to very fine grained sand, fining upwards, quartz with small clay blebs (~3mm) throughout, some darker clay crossbeds, indurated, 1455.8 Red grains appear in coarser sand at base	307
1456.2	1460.2	4.0	muddy sandstone, medium bluish gray 5B 5/1, medium grained, quartz, few feldspars, red rock fragments throughout, rounded grains, organics	308
1460.2	1463.6	3.4	muddy sandstone, dark yellow green 5GY 5/2 to grayish olive green 5GY 3/2 muddy sandstone with disrupted fabric, floating clasts of coal, silt, and mud, slickensides	309
1463.6	1463.8	0.2	lignite	
1463.8	1465.0	1.2	core lost	
1465	1465.6	0.6	sandy mudstone, gray 5G 4/1 sandy mudstone	310
1465.6	1467.4	1.8	sandstone, light gray sandstone with thin distorted flaser beds, organics and isolated floating blebs of green 5B 5/1 mudstone	

1467.4	1470.5	3.1	muddy sandstone, medium bluish gray 5B 5/1 fine grained sandstone, quartz	311
1470.5	1474.2	3.7	core lost	
1474.2	1479.2	5.0	muddy sandstone, medium bluish gray 5B 5/1 fine grained sandstone, subangular-subrounded grains, quartz, fining upwards, clay clasts up to 10cm, fracturing filled with calcite	312
1479.2	1483.4	4.2	muddy sandstone, medium gray N5 medium grained muddy sandstone, massive, fining upwards, some clay clasts and organics	313
1483.4	1484.1	0.8	muddy sandstone, horizontal bedding, coarse grained, quartz, red sandstone grains, some feldspars	314
1484.1	1486.2	2.1	muddy sandstone, medium gray N5, medium-fine grained, subangular, quartz and mica, red sand grains,	
1486.2	1488.3	2.1	silty mudstone, dark gray N3, slightly silty, slickensides, core was dropped and spaces incurred.	
1488.3	1492.3	4.0	sandy mudstone, medium gray N5 and dark gray N3, very fine grained sand, bioturbated	315
1492.3	1492.5	0.2	muddy sandstone, medium light gray N6, medium grained, laminated with organics, quartz, also red sand grains, subrounded	
1492.5	1493.7	1.2	sandstone, medium light gray N6 very fine grained, angular crossbeds with organics on bedding planes, red grains	316
1493.7	1495.4	1.7	sandstone, fine-medium grained light gray N6 sandstone with finer grained clasts within	
1495.4	1497.5	2.1	silty mudstone, medium gray to medium dark gray N4-N5 silty mudstone, slickensides	
1497.5	1499.6	2.1	muddy sandstone, medium light gray N6 and dark gray N3 very fine grained sand, mottling, bioturbation	317
1499.6	1500.5	0.9	sandy mudstone, dark gray N3, contains many dusky blue green 5BG 3/2 clay intraclasts, clay and sandstone laminations	
1500.5	1501.0	0.5	sandy mudstone, medium gray N5, fine (1mm) laminations	
1501	1501.5	0.5	sandstone, dark gray N3, pebble-sized clay intraclasts	
1501.5	1501.7	0.2	muddy sandstone, medium gray N5, very fine sand	318
1501.7	1501.8	0.1	silty mudstone, medium dark gray N4, slightly silty	
1501.8	1503.5	1.7	sandstone, greenish gray 5G 6/1, medium - coarse sand, muddy matrix, granule sized clay clasts throughout, some organics, poorly sorted, quartz	
1503.5	1506.5	3.0	mudstone, medium gray N5 and light gray N7, soft sediment deformation	
1506.5	1509.2	2.7	silty mudstone, dark gray N3, slightly silty, some areas of soft sediment deformation grading into grayish black	
1509.2	1511.5	2.3	sandy mudstone, medium gray N5, mostly silty, some fine grained sands,	319
1511.5	1511.7	0.2	muddy sandstone, medium gray N5 and light gray N7, areas of bioturbation marbled pattern, slickensides, some clay clasts	
1511.7	1512.3	0.6	drilling mud/clay	320
1512.3	1512.9	0.6	silty mudstone, grayish black N2, light gray N7 clast, slightly silty	

1512.9	1513.4	0.5	sandy mudstone, medium dark gray N4 - medium light gray N6 sandy mudstone, bioturbated	
1513.4	1514.4	1.0	drilling mud/clay	
1514.4	1518.5	4.1	sandy mudstone, medium dark gray N4 silty - medium light gray N6 sandy mudstone, ripple marks and fine laminations	321
1518.5	1519.8	1.3	sandy mudstone, fine sand size, quartz, moderately well sorted, thin laminations, low angle beds	322
1519.8	1520.1	0.3	silty mudstone, dark gray N3, silty mudstone, moderately well sorted, massive	
1520.1	1522.1	2.0	sandy mudstone, medium light gray N6, fine sand size, moderately well sorted, laminations,	
1522.1	1523.5	1.4	core lost	
1523.5	1524.6	1.1	silty mudstone, medium light gray N6, very fine sand, some coarse areas	323
1524.6	1528.0	3.4	muddy sandstone, greenish-gray 5G 6/1, fine sand, fine laminations with organic material on the bedding planes, finer grained blebs	
1528	1533.9	5.8	sandstone, medium light gray N6, very coarse sandstone fining upwards to a fine-grained muddy sandstone, quartz composition, subrounded grains, moderately well sorted, thin laminations with organics occurring on bedding planes, some oxidation	324-325
1533.9	1534.3	0.4	sandstone, poorly sorted, grayish blue green 5BG 5/2, medium sand of 20 mm, angular to rounded, mostly quartz, red grains	
1534.3	1538.7	4.4	silty mudstone, medium dark gray N5, amber 1 piece, slickensides throughout, bioturbated, leaf impression at 1538.5	326
1538.7	1539.5	0.8	gravelly mudstone, grayish blue-green 5BG 5/2 from fine sand to pebbles	327
1539.5	1543.4	3.9	silty mudstone, medium light gray N6, bioturbated, organics throughout	
1543.4	1545.6	2.2	sandstone, medium light gray N6 at top to very light gray N8 at base, fining upwards sequence from coarse sand to fine sand, sand color mud dusky blue green 5BG 3/2, organics N1, sand poorly sorted, rounded to subrounded, organics and mudstones form laminations	328
1545.6	1546.2	0.6	sandstone, very light gray N8, coarse sand, mod well sorted, subrounded, quartz, thin mud layers, dusky blue green 5BG 3/2, organics	329
1546.2	1547.2	1.0	sandstone, medium gray N5 to v light gray N8 to black N1, medium sand, well sorted, subrounded, quartz, organics form lineations and bedding planes, heavily bioturbated	
1547.2	1548.0	0.8	sandstone, medium gray N5 to v light gray N8 to black N1, fine sand, medium sand, well sorted, subrounded, quartz, organics form lineations and bedding planes, heavily bioturbated, very light gray N8	
1548	1550.3	2.3	sandstone, medium gray N5 to light gray N7 and black N1, very fine sand, quartz, mod well sorted, subrounded and subangular, micaceous, heavily bioturbated at 1548.2, cross beds, thin laminae	
1550.3	1552.0	1.7	silty mudstone, medium gray N5 to medium light gray N6, heavily disturbed bedding, fine sand pockets, slickensides	

1552	1553.3	1.3	sandstone, light brownish gray , 5YR 6/1, fine sand, well sorted, rounded, quartz, low angle bedding, 1552.7 - 1553.3	331
1553.3	1553.7	0.4	sandstone, light gray N6 to v light gray N8, medium sand, rounded, poorly sorted	
1553.7	1553.9	0.2	sandstone, light brownish gray 5YR 6/1, coarse sand, rounded, mod well sorted, cross bedded	
1553.9	1555.1	1.2	sandstone, light gray N6 to v light gray N8, medium sand, rounded, lignite layers/clasts, poorly sorted	
1555.1	1557.5	2.4	sandstone, medium light gray N6 to v light gray N8, fine sand, poorly sorted, angular to subangular, fining upwards sequence, organics, mud intraclasts	332
1557.5	1558.0	0.5	sandstone, medium light gray N6, medium sand, poorly sorted, angular to subangular, laminae of organics	
1558	1559.1	1.1	sandstone, greenish gray 5GY 6/1 and bluish white 5B 9/1, very fine sand, fine laminations, organics on bedding planes	333
1559.1	1559.6	0.5	sandstone, bluish white 5B 9/1 and medium light gray N6, medium – coarse sand, arkosic with kaolinite, some black clay clasts (3cm) contains black chert, poorly sorted	
1559.6	1560.3	0.7	silty mudstone, medium gray N5, disturbed laminations, bioturbation,	
1560.3	1561.0	0.7	sandstone, bluish white 5B 9/1 and medium light gray N6, very coarse sand, quartz, arkosic, floating green and gray clay clasts, some red granules, angular, poorly sorted with large black clay clasts on interior surfaces, slickensides, chert	
1561	1565.0	4.0	sandstone, coarse grained, poorly sorted, angular, quartz and arkosic, kaolinitization of feldspars, intraclasts, organics, concretion with abundant pyrite within and surrounding edges, poorly consolidated	334-335
1565	1566.5	1.5	sandy mudstone, dark gray N3 to medium light gray N6, horizontal bedding - wavy and bioturbated, burrows filled with very fine sand, small clay intraclasts	
1566.5	1566.6	0.1	silty mudstone, medium dark gray N4	336
1566.6	1568.3	1.7	mudstone, grayish black N2, slickensides	
1568.3	1571.7	3.4	muddy sandstone, medium light gray N6 to medium gray N5 with medium dark gray N4 bits of organic material, very fine grained, organic content decreases upward, also contains sparse granules of claystone, amber, charcoal	
1571.7	1573.3	1.6	silty mudstone, med. dark. gray N4 silty mudstone with two light gray N7 sandy mudstone interbeds, moderately well sorted, massive with few thin fine sand laminations, scattered organics, slickensides	337
1573.3	1573.5	0.2	sandy mudstone, light gray N7 sandy mudstone interbedded, moderately well sorted very fine sand and mud, thin sandy laminations	
1573.5	1576.7	3.2	silty mudstone unit same as 1571.7-1573.3'	
1576.7	1579.4	2.7	silty mudstone, med. dark. gray N4 silty mudstone, may be fining upwards, well sorted, massive with exception of thin silty lenses, blocky fracture, possible organic-rich mudstone at base of unit	338
1579.4	1580.3	0.9	silty mudstone, med. gray N5 silty mudstone, massive, moderately	

			well sorted, fine-grained blebs and organic fragments	
1580.3	1580.5	0.2	silty mudstone, med. dark. gray N4 silty mudstone, well sorted massive unit	
1580.5	1582.3	1.8	silty mudstone, med. dark. gray N4 silty mudstone, well sorted, massive	339
1582.3	1584.2	1.9	sandy mudstone, greenish gray 5G 6/1 sandy mudstone, fine sand, mud and silt, fining upwards, quartz and mica, subrounded grains, moderately well sorted, low angle crossbeds and laminations, mudstone rip-ups up to 50mm in length, burrowed	
1584.2	1584.3	0.1	drilling mud	
1584.3	1589.3	5.0	sandy mudstone, med. bluish gray 5B 5/1 sandy mudstone fining upwards from medium to fine sand, mostly quartz with some mica present, moderately well sorted, subrounded grains, cross-bedded and laminated with woody material.	340
1589.3	1590.5	1.2	sandy mudstone, med. gray N5 sandy mudstone interbedded with medium-fine sand and silt, crossbedding throughout, moderately well sorted with subrounded grains.	341
1590.5	1593.5	3.0	silty mudstone, med. dark gray N4 silty mudstone, well sorted with thin laminations in places, mostly massive with organic fragments throughout	
1593.5	1597.0	3.5	silty mudstone, dark gray N3 silty mudstone, well sorted, massive with laminations in lower 0.3 of core, small organic fragments scattered throughout	342
1597	1602.2	5.2	silty mudstone, dark. gray N3 silty mudstone, massive with slickensides on exposed surfaces, coarsens in middle of unit	343
1602.2	1603.4	1.2	mudstone, dark. gray N3 carbonaceous mudstone with some clay	344
1603.4	1604.1	0.7	claystone, dark. gray N3 claystone.	
1604.1	1604.6	0.5	silty mudstone, dark. gray N3 silty mudstone	
1604.6	1605.1	0.5	claystone, dark. gray N3 claystone.	
1605.1	1605.8	0.7	silty mudstone, dark. gray N3 silty mudstone	
1605.8	1607.1	1.3	silty mudstone, dark. gray N3 silty mudstone alternating with N5 siltstone	
1607.1	1607.5	0.4	sandstone, med. dark. gray N4 very fine sandstone	
1607.5	1608.0	0.5	muddy sandstone, very light gray N8 muddy sandstone with intraclasts of N5 mudstone and bioturbation	345
1608	1612.3	4.3	sandstone, med. gray N5 sandstone. Well developed fining upward sequence with granules at the bottom, massive with quartz, arkosic well sorted, subrounded grains.	
1612.3	1612.5	0.2	sandstone, med. gray N5 medium sandstone with subrounded grains, some clay clasts.	346
1612.5	1613.1	0.6	sandstone, dusky blue 5BG 3/2, very coarse sand, organic fragments, 1612.75' darker siltstone lens	
1613.1	1613.3	0.2	siltstone, med. dark gray N3 siltstone	
1613.3	1613.5	0.2	sandy mudstone, med. dark. gray N3 siltstone with embedded very coarse sand	

1613.5	1614.9	1.4	sandstone, finely laminated near horizontal beds, fine to very fine sand, predominantly med. dark. gray N3 with some bluish, greenish, brown and tan layers at top, lower laminae below 1614.0 all gray, 30% quartz, some organic fragments	
1614.9	1616.4	1.5	sandstone, fine to very fine medium light gray N6 to medium gray (N5) sandstone, laminations, 1615.6' silty mudstone layer, 1616.2 1616.4 larger dark. gray siltstone laminae	
1616.4	1616.6	0.2	sandstone, medium gray, coarsening downward	
1616.6	1616.8	0.2	sandstone, dark. gray N2 medium to coarse mottled sandstone	347
1616.8	1617.4	0.6	sandstone, medium gray N5 very fine grained sandstone with fine laminations, organic material along bedding planes.	
1617.4	1621.6	4.2	sandstone, medium gray N5 medium grained sandstone with organic material spread throughout, quartz and feldspar grains, alternating bands of coarser material	
1621.6	1626.7	5.1	sandstone, medium gray N5 coarse grained sandstone with mottles and clasts up to 6mm. Faint bedding, composed of quartz, feldspar, poorly sorted	348
1626.7	1628.8	2.1	sandstone, greenish gray 5G 6/1 to white N9 gravelly sandstone composed of quartz, arkosic material, pebble sized dusky blue green 5BG 3/2 clay clasts, feldspars weathering to kaolinite, poorly sorted, massive	349
1628.8	1630.1	1.3	muddy sandstone, greenish gray 5G 6/1 fine to medium grained sandstone with muddy matrix, poorly sorted, composed of quartz, arkose, kaolinitized grains, vague x-bedding, subangular grains, gradational contact with above.	
1630.1	1630.8	0.7	muddy sandstone, greenish gray 5G 6/1 medium to coarse grained sandstone with muddy matrix composed of arkose, quartz grains with clay clasts	
1630.8	1631.3	0.5	muddy sandstone, greenish gray 5G 6/1 medium to very coarse sandstone with muddy matrix, composed of arkose, quartz, clasts of clay and kaolinite, very poorly sorted, angular grains	
1631.3	1633.1	1.8	muddy sandstone, greenish gray 5G 6/1 fine to medium grained sandstone with muddy matrix composed of arkose, quartz, subangular grains, massive, fining upwards	350
1633.1	1637.0	3.9	muddy conglomerate, dusky blue green 5BG 3/2 muddy conglomerate with cobble sized gray clay clasts, arkosic pebbles, black chert and quartz pebbles with dark gray clay clasts, entire tube has calcareous matrix, poorly sorted, rounded to subrounded grains, fining upwards	351
1637	1638.0	1.0	sandy mudstone, med. dark gray N4 to N7 mottled sandy mudstone with bioturbation, sharp contact with above.	
1638	1638.2	0.2	core lost	
1638.2	1638.5	0.3	sandy mudstone, med. dark gray N4 to N7 mottled sandy mudstone with bioturbation	
1638.5	1640.5	2.0	silty mudstone, light gray N7 to N3 silty mudstone with fine	

			laminations, organic material on bedding planes, x-bedded laminations, and some very fine sand.	
1640.5	1640.9	0.4	silty mudstone, bluish white 5B 9/1 and grayish black N2 silty mudstone with very fine laminations, organic material along bedding planes, calcareous matrix, slight x-bedding.	
1640.9	1641.3	0.4	muddy sandstone, dusky blue green 5G 3/2 muddy sandstone with arkose and quartz, poorly sorted, very coarse grained, coarsening upwards, subrounded with some clay clasts.	
1641.3	1642.4	1.1	muddy sandstone, greenish gray 5G 6/1 and bluish white 5B 9/1 fine grained sandstone in muddy matrix composed of quartz, arkose, gray clay clasts, vague x-bedding with organic material, coarsens upwards	352
1642.4	1646.5	4.1	sandy mudstone, greenish gray 5G 6/1 to medium bluish gray 5B 5/1 mottled sandy mudstone with quartz, subrounded grains, slickensides	
1646.5	1646.8	0.3	silty mudstone, dusky blue green 5BG 3/2 silty mudstone	353
1646.8	1647.7	0.9	gravelly sandstone, dusky blue green 5BG 3/2 and grayish blue green 5BG 5/2 gravelly sandstone with a muddy matrix, grains of arkose, quartz, clay clasts, red granules, poorly sorted, massive,	
1647.7	1648.7	1.0	silty mudstone, greenish gray 5G 6/1 silty mudstone with some very fine grained sands of quartz, mottled and bioturbated	
1648.7	1649.9	1.2	mudstone, medium gray N5 mudstone grading into lignite seams, lots of organic material	
1649.9	1651.0	1.1	silty mudstone, medium gray N5 silty mudstone, poorly consolidated.	
1651	1651.5	0.5	core lost	
1651.5	1653.1	1.6	silty mudstone, medium dark gray N4 silty mudstone, poorly sorted, massive, slickensides, organic material, chippy.	354
1653.1	1654.0	0.9	core lost	
1654	1656.5	2.5	silty mudstone, medium dark gray N4 silty mudstone, poorly sorted, massive, slickensides, organic material, chippy.	355
1656.5	1660.7	4.2	silty mudstone, medium gray N5 slightly silty mudstone with slickensides on exposed surfaces, organic material, some bedding near bottom	356
1660.7	1661.8	1.1	muddy sandstone, grayish blue green 5BG 5/2 fine grained muddy sandstone fining upwards to a silty mudstone, sand fraction is mostly quartz with subrounded grains.	
1661.8	1663.2	1.4	silty mudstone, medium gray N5 silty mudstone coarsening upwards with silty laminae near top, organic fragments and slickensides throughout	
1663.2	1665.0	1.8	silty mudstone, grayish green 10G 4/2 silty mudstone coarsening upwards to silt, moderately well sorted with slickensides.	
1665	1667.9	2.9	silty mudstone, dusky blue green 5BG 3/2 slightly silty mudstone, almost a claystone, organic material throughout	357
1667.9	1668.7	0.8	silty mudstone, light gray N7 to N6 and 5BG 3/2 as above, very fine grained silty mudstone fining upward, well laminated with bioturbation in middle, no bioturbation at top or bottom, blebs of fine material.	
1668.7	1670.0	1.3	claystone, dusky blue green 5G 3/2 claystone, slickensides on	

		exposed surfaces	
1670	1671.2	1.2	sandstone, medium light gray N6 to N5 fine to medium sandstone with organic material throughout, thick fine grained laminae, unit is poorly sorted with quartz and red grains throughout. 358
1671.2	1672.2	1.0	silty mudstone, grayish black N2 silty mudstone with slickensides on exposed surfaces, mostly organic material, massive.
1672.2	1674.2	2.0	sandy mudstone, light gray N7 to N4 very fine grained sandy mudstone with bioturbation throughout, roots near bottom, fine to medium laminations where not bioturbated.
1674.2	1675.2	1.0	silty mudstone, dark gray N3, dusky blue green 5BG 3/2 slightly silty mudstone, almost a claystone, with slickensides exposed on surfaces, massive. 359
1675.2	1675.8	0.6	sandstone, medium gray N5 very fine grained sandstone with bioturbation, coarser infills, and faint bedding.
1675.8	1677.8	2.0	silty mudstone, dark gray N3 to grayish black N2 slightly silty mudstone, slickensides exposed on all surfaces
1677.8	1680.3	2.5	sandstone, medium light gray N6 very fine grained sandstone with slickensides and organic material, moderately well sorted. 360
1680.3	1682.8	2.5	silty mudstone, light olive gray 5Y 6/1 silty mudstone, poorly laminated, thin calcareous layers N8 to N9 in color, organic material throughout. 361
1682.8	1682.9	0.1	claystone, medium dark gray N4
1682.9	1684.7	1.8	silty mudstone, light olive gray 5Y 6/1 silty mudstone, poorly laminated, thin calcareous layers, organics.
1684.7	1687.8	3.1	silty mudstone, medium dark gray N4 silty mudstone, "chippy," organic material throughout. 362
1687.8	1688.0	0.2	mudstone, brownish gray 5YR 2/1 carbonaceous mudstone, lignitic clasts 363
1688	1690.2	2.2	lignite, black N1
1690.2	1691.6	1.4	silty mudstone, dark greenish gray 5G 4/1 silty mudstone, massive, some organics
1691.6	1692.8	1.2	sandy mudstone, interlaminated bluish gray 5B 5/1 and light olive gray 5Y 6/1 siltstone and very fine grained sandstones, bioturbated throughout.
1692.8	1693.0	0.2	sandstone, interlaminated bluish gray 5B 5/1 and light olive gray 5Y 6/1 siltstone and very fine grained sandstones, bioturbated throughout. 364
1693	1697.8	4.8	silty mudstone, medium gray N5 to light brownish gray 5YR 6/1 silty mudstone interlaminated with very fine grained sandstones, well developed bedding and laminations
1697.8	1699.8	2.0	sandy mudstone, medium gray N5 to N6 very fine grained sand mudstone, ripple laminated, bioturbated, organic material on bedding planes. 365
1699.8	1701.4	1.6	sandy mudstone, dark gray N3 to N5 very fine grained sandy mudstone with alternating bands of bioturbation and laminations.
1701.4	1702.8	1.4	sandy mudstone, dark gray N3 to N5 very fine grained sandy

			mudstone with alternating bands of bioturbation and laminations, x-bedding	
1702.8	1704.0	1.2	sandstone, medium gray N5 to medium dark gray N4, interbedded sandstone and silty mudstone, moderately well sorted, subrounded, quartz, very fine sand layers are disturbed probably by soft sediment deformation, some ripple trough fills observed	366
1704	1711.3	7.3	silty mudstone, medium dark gray N4, interbedded with some very fine sandstone, thin laminations and bioturbated throughout, observed ripple marks and/or crossbeds in the sandy units	367
1711.3	1712.5	1.2	sandstone, light gray N4, gradational contact, fine-medium sandstone, moderately well sorted, angular to rounded with slight bedding visible but mostly massive, mostly quartz	368
1712.5	1715.4	2.9	silty mudstone, medium dark gray N4, slightly silty mudstone with several bands of yellowish gray 5Y 8/1 clay and very light gray N8 medium sandstone, some bioturbation, massive lenses which are massive, moderately well sorted, angular to rounded	
1715.4	1716.0	0.6	sandstone, light gray N7, medium grained sandstone, faint bedding, poorly sorted, large pebble-size clay clast near bottom	
1716	1716.7	0.7	silty mudstone, dark gray N3 and light olive gray 5Y 6/1, 0.1' laminations	369
1716.7	1717.6	0.9	sandstone, white N9, very fine grained, calcareous cement, quartz, mottled wavy contacts on both ends	
1717.6	1718.5	0.9	silty mudstone, dark gray N3 silty mudstone, some laminations and floating clasts of grayish orange 10 YR 7/4	
1718.5	1720.3	1.8	sandstone, medium gray N5, coarse to medium grained, coarsening upwards, quartz, angular grains, poorly sorted, gray clay rip-up clasts throughout (1.5 cm), vaguely laminated	
1720.3	1720.9	0.6	sandstone, sharp contact, well rounded very coarse sand, quartz, chert grains, red grains, poorly sorted; this grades into a silty mudstone, dark gray N3 and light olive gray 5Y 6/1	
1720.9	1722.8	1.9	sandy mudstone, grayish orange 10 YR 7/4 and medium dark gray N4 mudstone with very fine grained sand, granule sized angular gray clasts, some organics grading into medium dark gray sandy mudstone	370
1722.8	1723.0	0.2	lignite and mudstone, black N1 lignite and grayish black N2 interlaminated mudstone	
1723	1723.8	0.8	silty mudstone, medium dark gray N4	
1723.8	1724.0	0.2	sandstone, light olive gray 5Y 5/2, fine grained quartz sand	
1724	1725.7	1.7	silty mudstone, medium dark gray N4, slightly silty, slickensides, grading into more silt and some fine grained sand	
1725.7	1728.9	3.2	sandy mudstone, medium gray N5 and medium light gray N6, silty mudstone interbedded with lighter colored sandy mudstone, laminations disturbed, some organic material observed	371
1728.9	1729.2	0.3	silty mudstone, grayish green 10G 4/2	
1729.2	1729.7	0.5	lignite, black N1	
1729.7	1730.0	0.3	core lost	

1730	1731.5	1.5	silty mudstone, grayish black N2, slightly silty mudstone, poorly consolidated, brittle surface	372
1731.5	1734.5	3.0	sandy mudstone, medium bluish gray 5B 5/1 silty mudstone and medium light gray N6 sandy mudstone laminations, slightly disturbed in the middle, finely laminated at the basal end (1mm)	
1734.5	1737.0	2.5	silty mudstone, medium dark gray N4 silty mudstone and light gray N7 siltstone interlaminated, fine laminations, some disturbed	373
1737	1746.9	9.9	silty mudstone, medium bluish gray 5B 5/1, mottled, clay rip-up clasts, at 1738.2 the color is medium gray N5 mottled with medium light gray N6 bioturbated laminations, one burrow is filled with calcareous matter at 1740.2, core becomes more massive at 1744, organics	374-376
1746.9	1751.6	4.7	sandy mudstone, greenish gray 5G 6/1 silty mudstone mottled with light greenish gray 5G 8/1 sandy mudstone, very fine grained sand, mostly silty with some bioturbation and clay rip-ups, low angle crossbeds observed between 1751.1-1751.2	377
1751.6	1751.7	0.1	silty mudstone, medium dark gray N4	
1751.7	1752.0	0.3	core lost	
1752	1752.7	0.7	silty mudstone, medium gray N5, some disrupted laminations and floating yellow clasts	378
1752.7	1752.8	0.1	silty mudstone, pale yellowish brown 10YR 6/2, very slight amounts of silt (less than 1 mm laminations)	
1752.8	1753.4	0.6	silty mudstone, medium dark gray N4 mudstone, fractured and filled with white N9 calcareous cement, fractured vertically	
1753.4	1757.0	3.6	silty mudstone, pale yellowish brown 10YR 6/2, very slight amounts of silt (less than 1 mm laminations, at 1753.8 the color changes to dark gray N3, slightly silty, brittle core surface, some grayish orange 10 YR 7/4 floating mud clasts	
1757	1761.9	4.9	sandy mudstone, very light gray N8 to light gray N2 sandy mudstone and medium gray N5 silty mudstone, very fine-fine quartz sand, fining upwards, mod. well sorted, thin horizontal laminae, some wavy, from 1757-1758 fine blebs, bioturbated	379
1761.9	1762.0	0.1	core lost	
1762	1769.0	7.0	silty mudstone, medium gray N5, some medium light gray N6 sandy mudstone laminae, very fine grained, moderately well sorted, 45 degree angled crossbeds at 1762-1763.2, indurated. At 1764-1767 massive silty mudstone, fissile, root traces, at 1767.8 clay blebs (<4mm)	380
1769	1774.7	5.7	silty mudstone, dark gray N3 in upper portion, medium gray N5 in lower portion, well sorted, massive, slickensides, dark organic rich upper layers, fissile, some coarser bedding after 1773.6, organics throughout	381-382
1774.7	1775.9	1.2	muddy sandstone, medium gray N5 muddy sandstone to very fine sandstone w/ laminations, very bioturbated, laminations disappear towards the bottom of the unit, scattered organics	383
1775.9	1777.0	1.1	sandy mudstone, light gray N7 muddy sandstone or sandy mudstone with bioturbation and not much bedding, some very fine sand areas throughout	

1777	1777.9	0.9	sandstone, medium gray N5 to medium dark gray N4, very fine grained, intensely laminated and bioturbated, some trough cross-beds, everything is on a slant (angled)	
1777.9	1785.2	7.3	silty mudstone, medium dark gray N4, well sorted, wavy crossbedding, subtly fining upwards	384-385
1785.2	1790.1	4.9	silty mudstone, medium gray N5 and pale yellow orange 10 YR 8/2, massive with tilted lenses of brown silty mudstone	386
1790.1	1794.6	4.5	silty mudstone, light gray N7, massive, root cast at 1790.6-1790.9, thin medium dark gray N4 clay laminations increasing towards base	387
1794.6	1799.4	4.8	silty mudstone, light olive gray 5Y 6/1, massive, some floating small clay clasts, laminations formed by lignitic lenses below 1797.6 oriented horizontally, indurated	388
1799.4	1801.9	2.5	silty mudstone, medium gray N5 to medium dark gray N4, organic clasts from 1800.5-1800.6, bioturbation, soft sediment deformation at 1800.4	389
1801.9	1802.0	0.1	core lost	
1802	1805.8	3.8	silty mudstone, pale yellowish brown 10 YR 6/2 some soft sediment deformation, organics, section with fine laminations after 1804.6	390
1805.8	1806.8	1.0	silty mudstone, grayish black N2 claystone and medium dark gray N4 silty mudstone layered in 0.1' intervals	
1806.8	1809.0	2.2	claystone, grayish black N2, slickensides, poorly consolidated, organic material	
1809	1809.4	0.4	silty mudstone, medium dark gray N4, slightly silty, slickensides, some organic material	
1809.4	1809.6	0.2	core lost	
1809.6	1813.8	4.2	claystone, grayish black N2, slickensides, some organic material, organic bedding, uniform, brittle core surface	391
1813.8	1814.5	0.7	silty mudstone, medium dark gray N4, organic material	
1814.5	1814.6	0.1	core lost	
1814.6	1816.2	1.6	silty mudstone, dark gray N3, uniform, organic bits floating, brittle core surface	392
1816.2	1816.9	0.7	carbonaceous mudstone, brownish black 5YR 2/1, laminated with black organics on bedding planes	
1816.9	1820.7	3.8	lignite, black N1 lignite	393
1820.7	1821.7	1.0	mudstone, brownish black 5YR 2/1 and black N1 carbonaceous mudstone and lignite	
1821.7	1823.1	1.4	claystone, grayish black N2, gradational contact	
1823.1	1824.2	1.1	silty mudstone, medium dark gray N4 to N5, almost a claystone but slightly silty with darker organic layers	394
1824.2	1827.2	3.0	claystone, grayish black N2, gradational contact, at 1825.6 the color changes to a medium light gray N6 to N5 with thick coal at 1826	
1827.2	1828.0	0.8	silty mudstone, grayish black N2 silty mudstone, very organic	
1828	1833.0	5.0	silty mudstone, medium light gray N6 to dark gray N3, massive, well	

		sorted, fissile, indurated, bioturbated from 1824-1830.6 and silty blebs from 1830-1831 (approximately 12mm)	395
1833	1838.4 5.4	silty mudstone, dark greenish gray 5G 4/1 in upper portion of the unit, to medium dark gray N4 at the lower part, massive, fissile, rare clay blebs at 1833.9', scattered organic material at the base of the unit, slickensides	396
1838.4	1841.9 3.5	lignite, black N1, tonstein layers at 1841.5-1841.6	397
1841.9	1843.9 2.0	silty mudstone, medium dark gray N4, well sorted, fissile, slickensides, massive	398
1843.9	1844.5 0.6	silty mudstone, medium light gray N6, laminated, silt lenses, possible burrows or root traces	
1844.5	1844.9 0.4	silty mudstone, dark gray N3, massive, well sorted, leaf fossils	
1844.9	1845.0 0.1	core lost	
1845	1847.0 2.0	silty mudstone, medium dark gray N4, well sorted, laminations, organic fragments on bedding planes, indurated	399
1847	1847.5 0.5	lignite, black N1, massive, slickensides, organics	
1847.5	1847.8 0.3	core lost	
1847.8	1851.4 3.6	lignite, black N1 to grayish black N2, small fine grained sand bed observed at 1848.2, mostly coal with very small clay clasts (2-3mm), fissile, well sorted	400
1851.4	1855.2 3.8	sandstone, grayish black N2 in upper portion grading into a light olive gray 5Y 6/1 at the base, lower medium sized grains, moderately well sorted, quartz with lignite grains and larger organics further down, rounded, massive	401
1855.2	1865.2 10.0	sandstone, light gray N7-N6, well sorted, clean quartz sandstone, subangular to subrounded, possible bedding	402
1865.2	1884.3 19.1	sandstone, light gray N7-N6, same as above, pebble sized dark gray N3 fine grained clast at 1867.0	403

Casing set and redrilling of section necessitated by cave-in. A portion of the section is re-cored

1797	1801.8 4.8	silty mudstone, med. gray N5, highly slickensides, fine blebs at 1797.7, poorly developed laminations and organics on bedding planes, woody material at 1800.8	1A
1801.8	1802.5 0.7	lignite, grayish-black N2 with leaf fragments	2A
1802.5	1804.4 1.9	silty mudstone, med. dark gray N4, massive between 1802.5-1803.1, laminated between 1803.1-1804.4	
1804.4	1805.0 0.6	core lost	
1805	1806.9 1.9	silty mudstone, dark gray N3 to medium dark gray N4 with zones of grayish black N2 claystone	3A
1806.9	1807.1 0.2	lignite	
1807.1	1808.1 1.0	silty mudstone, dark gray N3 to medium dark gray N4 with zones of grayish black N2 claystone	

1808.1	1808.2	0.1	lignite	
1808.2	1813.8	5.6	silty mudstone, dark gray N3 to medium dark gray N4 with zones of grayish black N2 claystone	
1813.8	1816.2	2.4	claystone, med. dark. gray N4 with slickensides	4A
1816.2	1816.8	0.6	silty mudstone, med. gray N4 with lighter blebs of claystone	5A
1816.8	1820.4	3.6	lignite, black N1	
1820.4	1821.0	0.6	lignite, brownish black 5YR 2/1	6A
1821	1824.0	3.0	claystone, dark. gray N3, abundant slicks	
1824	1825.9	1.9	lignite, black N1	7A
1825.9	1826.3	0.4	claystone, grayish black N2	
1826.3	1827.4	1.1	silty mudstone, black to grayish black N1-N2	
1827.4	1827.8	0.4	lignite/claystone, black claystone N1 with lignite interbeds	
1827.8	1829.5	1.7	claystone, dark gray N3 with abundant slickensides	
1829.5	1838.0	8.5	silty mudstone, medium gray N4, fissile with slickensides	8A-9A
1838	1838.8	0.8	claystone, dark clay N3 with slickensides	9A
1838.8	1842.1	3.3	lignite, black N1 with tonstein blebs	10A
1842.1	1842.2	0.1	core lost	11A
1842.2	1844.5	2.3	silty mudstone, medium dark gray N4, fissile	
1844.5	1846.8	2.3	silty mudstone, grayish black N2 with medium dark gray laminations N4	12A
1846.8	1850.5	3.7	lignite, black N1, some amber	
1850.5	1855.3	4.8	sandstone, moderate brown 5YR 4/4 fine-grained quartz, rounded, well-sorted, massively bedded, organics, becoming brown 5YR 2/2 at 1852.5 and pale brown 5YR 5/2 at 1853.8	13A-14A
1855.3	1861.5	6.2	sandstone, medium light gray N7, medium to coarse grained, subrounded to well-rounded, well-sorted, massive, 99% quartz	15A
1861.5	1862.3	0.8	core lost	16A
1862.3	1865.0	2.7	sandstone, medium light gray N7, medium to coarse grained, subrounded to well-rounded, well-sorted, massive, 99% quartz	
1865	1884.0	19.0	sandstone, medium light gray N6, medium fining up to fine grained, well-rounded, well-sorted, massive, quartz, dark gray metallic nodule at 1866.5, 1872.4, thin black lamination of mica at 1875, grayish orange pink 5YR 7/2 lamination at 1879.2	17A-20A
1884	1887.0	3.0	core lost	
1887	1889.1	2.1	sandstone, medium light gray N7, medium to very coarse grained, rounded to sub-rounded, 99% quartz	21A
1889.1	1890.0	0.9	core lost	
1890	1895.0	5.0	sandstone, medium light gray N7, medium to very coarse grained, rounded to sub-rounded, 99% quartz, very coarse between 1891-2	22A
1895	1897.6	2.6	sandstone, med. light gray N7, fine grained, well-rounded, well-sorted, massive	23A
1897.6	1898.0	0.4	sandstone, coarse, poorly sorted, quartz	
1898	1905.2	7.2	sandstone, med. light gray N7, fine grained, well-rounded, well-sorted, massive	24A
1905.2	1915.2	10.0	sandstone, very fine grained, light gray N7 to medium dark gray N4,	

			poorly sorted at top but moderately well-sorted throughout, subrounded, quartz, bioturbated in places	25A-26A
1915.2	1923.0	7.8	sandstone, fine to medium grained, with organics, bioturbation from 1916.5-1919, medium light gray N6 to med. gray N5, subrounded, sometimes silty, fining upwards	27A-28A
1923	1935.2	12.2	sandstone, med. grained, med. gray N5 at top and lt. gray at base, with large horizontal and vertical burrows between 1926-1927	28A-30A
1935.2	1940.2	5.0	sandstone, medium grained, dark. greenish gray 5G4/1, subrounded, bioturbated with large horizontal and vertical burrows, quartz	31A
1940.2	1945.2	5.0	sandstone, medium grained, medium gray N5, rounded to subrounded, bioturbated between 1940-1941, quartz	32A
1945.2	1949.2	4.0	sandstone, medium light gray N7, fine grained, well-sorted, large horizontal burrows at 1948 (15mm), subrounded	33A
1949.2	1949.5	0.3	core lost	
1949.5	1954.5	5.0	sandstone, medium light gray N6-N7, fine-med. grained, well-sorted, some shaley layers	34A
1954.5	1959.5	5.0	sandstone, light gray N7 to medium light gray N6, very fine to fine grained, salt and pepper (20% dark grains), subangular to subrounded, clear smoky quartz	35A
1959.5	1964.3	4.8	sandstone, medium dark gray N4-5, fine grained, well-sorted	36A
1964.3	1964.5	0.2	core lost	
1964.5	1984.5	20.0	muddy sandstone, medium dark gray N4 to medium light, gray N6, fine grained with thin mudstone and siltstone laminations, shell fragments with mother of pearl, pyrite crystals, carbonate cemented layers	37A-40A
1984.5	1988.3	3.8	silty mudstone, medium dark gray N4 , bioturbated, shell fragments	
1988.3	1989.0	0.7	sandstone, medium gray N5, fine-med. grained, well-sorted, quartz	
1989	1989.6	0.6	silty mudstone, medium dark gray N4,bioturbated, shell fragments	41A
1989.6	1993.9	4.3	muddy sandstone, medium gray N5, interbedded, bioturbated from 1991-1993.9	42A
1993.9	1994.0	0.1	core lost	
1994	1998.2	4.2	silty mudstone medium dark gray N5, interbedded fine sands, shell fragments, burrows	43A
1998.2	1999.0	0.8	sandstone, medium light gray, very fine grained	
1999	2003.8	4.8	sandy mudstone, medium light gray N6 to medium dark gray N4 burrows	44A
2003.8	2009.1	5.3	siltstone, medium gray N5, bioturbated, shell fragments	45A
2009.1	2015.2	6.1	muddy sandstone, medium gray N5, very fine grained, scattered shell fragments, bioturbated at base	46A
2015.2	2016.4	1.2	sandstone, light gray N7, very fine grained, carbonate cemented	47A
2016.4	2018.1	1.7	muddy sandstone, medium dark gray, bioturbated	

2018.1	2033.9	15.8	muddy sandstone, olive gray 5Y 4/1 to light gray N7 and N5, interbedded sandstone and siltstone, severely bioturbated, shell fragments	48A
2033.9	2034.9	1.0	sandstone, fine grained	51A
2034.9	2040.5	5.6	sandy mudstone, medium gray N5, interbedded sandstone and siltstone, severely bioturbated	52A
2040.5	2044.5	4.0	muddy sandstone, dark greenish gray 5GY 4/1, highly bioturbated	53A
2044.5	2051.2	6.7	sandy mudstone, medium gray N5 to medium dark gray N4, highly bioturbated, sand-filled burrows, some shell fragments	54A-56A
2051.2	2072.0	20.8	silty mudstone, medium gray N5, highly bioturbated, sand-filled burrows, some shell fragments, vertical pipe burrow at 2054.2-2054.6	56A-60A
2072	2072.2	0.2	sandstone, light gray N7, very fine grained, horizontal laminae	60A
2072.2	2072.3	0.1	claystone	
2072.3	2072.8	0.5	sandstone, light gray N7, very fine grained, with shell hash, shale rip-ups, hackly appearance	
2072.8	2117.4	44.6	sandstone, light gray N7 to medium dark gray N4, very fine grained, indurated with CaCO ₃ cement above 2075.4, massive, quartz well sorted, low angle cross beds enhanced by dark minerals between 2102-2105, shell fragments at 2013.9	60A-69A
2117.4	2118.9	1.5	mudstone, dark gray N3 - N4, calcareous	
2118.9	2120.1	1.2	sandstone	
2120.1	2120.3	0.2	mudstone, dark gray N3, calcareous	70A
2120.3	2124.3	4.0	sandstone, medium light gray N6 sandstone and medium dark gray silty mudstone interbeds, bioturbated, calcareous cement, some minor cross beds, some shells including gastropods	
2124.3	2127.5	3.2	silty mudstone, medium gray N5 and light brownish gray 5YR 6/1, heavily bioturbated but also some zones of fine laminations	71A
2127.5	2129.5	2.0	sandstone, medium light gray N6 sandstone and medium dark gray N4 silty mudstone interbeds, bioturbated, calcareous cement in mud but not sands, soft sediment deformation at 2128.6-2128.7	
2129.5	2130.3	0.8	muddy sandstone, grayish black N2 laminations and medium light gray N6 fine sand, subrounded, poorly sorted, quartz	72A
2130.3	2130.6	0.3	silty mudstone, dark gray N3, horizontally bedded	
2130.6	2134.0	3.4	sandstone, medium light gray N6, fine sandstone, subrounded, mod. well to well sorted, quartz, very thin laminations of darker grains	
2134	2134.3	0.3	core lost	
2134.3	2134.6	0.3	sandstone, medium gray N5, fine sand, subrounded, poorly sorted, quartz	73A
2134.6	2134.9	0.3	sandstone, medium light gray N6 sandstone and dark gray N3 silty mudstone interbeds, bioturbated, soft sediment deformation	
2134.9	2136.4	1.5	sandstone, medium gray N5, fine sand, subrounded, mod well sorted, quartz, fine laminations	
2136.4	2138.9	2.5	sandstone, medium light gray N6 sandstone and dark gray N3 silty	

2138.9	2139.5	0.6	mudstone interbeds, bioturbated, soft sediment deformation sandstone, medium gray N5, fine sand, subrounded, mod well sorted, quartz, fine laminations	
2139.5	2140.9	1.4	muddy sandstone, medium light gray N6, poorly sorted, subangular, fine horizontal laminations, quartz	74A
2140.9	2144.0	3.1	sandstone, medium light gray N6 sandstone and dark gray N3 to medium gray N5 silty mudstone interbeds, bioturbated, some fine laminae, calcareous cement	
2144	2144.4	0.4	core lost	
2144.4	2154.3	9.9	silty mudstone, grayish black N2 to medium light gray N6, bioturbated in broad zones, cross-beds, horizontal laminae, calcareous cement, gastropod at 2150.7	75A-76A
2154.3	2159.3	5.0	silty mudstone, medium dark gray N4, quartz and silt component, well sorted, bioturbated throughout, few fine sand laminations, 2157.4-2157.5 bivalve assemblage	77A
2159.3	2164.3	5.0	sandy mudstone, medium dark gray N4 to dark gray N3, sandy component is fine to v. fine, moderately well sorted, indurated, some laminations but mostly bioturbated, 2161.0-2164.3 bivalve fragments	78A
2164.3	2169.3	5.0	muddy sandstone, medium dark gray N4 to dark gray N3, fining upwards, sand size varies from med./fine sand to fine/v. fine sand, bioturbation, terebellina trace fossils, scattered bivalve fragments between. 2167.0-2169.0, moderately well sorted	79A
2169.3	2176.1	6.8	muddy sandstone, medium dark gray N4 dark gray N3, medium to fine grained, laminar structure disrupted by bioturbation, scattered fossil mollusk fragments (predominantly bivalves w/ rare gastropods), rare organic material, mod. well sorted, scattered calcareous nodules.	80A-81A
2176.1	2179.5	3.4	sandstone, medium dark gray N4 to medium gray N5, fine grained, basal portion has greater proportion of mud than upper portion, 2176.05-2177.1' massive sandstone, bivalve fragments, highly bioturbated, terebellina trace fossil, calcareous nodules, mod. well sorted	81A-82A
2179.5	2181.8	2.3	sandstone, medium gray N5 to med. dark gray N4, fine-grained, bioturbation, scattered mollusk fragments, calcareous nodule, moderate well sorted, indurated	82A
2181.8	2185.9	4.1	limey sandstone, light gray N7, fine to very fine sand, moderately well sorted to well sorted, rare laminations, mostly bioturbated, some yellowish calcareous concretions,	82A -83A
2185.9	2189.9	4.0	silty mudstone medium dark gray N4, some darker silty areas, sharp contact, some calcareous concretions, slightly black organic flecks, bioturbated, dark gray N3 shale clast at 2189.5, heavily churned sand	83A
2189.9	2195.0	5.1	muddy sandstone, dark gray N3 and medium gray N5, very fine grained, extremely bioturbated, occasional black organic flecks, weekly laminar at base	84A

2195	2196.8	1.8	muddy sandstone, medium light gray N6, bioturbated, interbedded and finely laminated at base	85A
2196.8	2196.9	0.1	silty mudstone, dark gray N4	85A
2196.9	2200.0	3.1	sandy mudstone, medium light gray N6 and medium gray N5, bioturbated, large yellowish-gray (5Y 7/2) clast at 2198.9 and some smaller clasts at basal end of core are calcareous nodules	85A
2200	2204.3	4.3	muddy sandstone, medium dark gray N4, very fine grained, fining upward, bioturbated, contains occasional shell fragments, calcareous concretions and black organic stringers (2203-2203.5), angular grains, quartz with mica and a few feldspar grains	86A
2204.3	2208.9	4.6	muddy sandstone, medium dark gray N4 to medium light gray N5 interbedded and bioturbated, some slightly calcareous areas, very fine-grained, angular grains, some shell fragments, organic fragments	87A
2208.9	2213.8	4.9	muddy sandstone, very light gray N2 and medium dark gray N3, very fine sand, angular, poorly sorted, heavily bioturbated, burrows, bivalve fossil, mottled appearance	88A
2213.8	2218.6	4.8	muddy sandstone, medium gray N5, very fine-grained, angular, quartz and mica composition, some black organic stringers, well sorted, bioturbated giving core mottled appearance, indurated, some shell fragments.	89A
2218.6	2223.4	4.8	muddy sandstone, medium dark gray N4 and dark gray N5, very fine grained, angular grains, well sorted, crushed shell material, calcareous nodule, bioturbated, organics	90A
2223.4	2228.3	4.9	muddy sandstone, medium gray N5, carbonate concretions at 2224.5, severely bioturbated, shell fragments and organics throughout, fine-grained, at 2227.4 grayish-orange 10YR 7/4 layer containing silt, organics, calcareous	91A
2228.3	2230.9	2.6	muddy sandstone, medium gray N5 and dark gray N3 interbedded and bioturbated, some terebellina traces, organics, sandy at base	92A
2230.9	2235.9	5.0	sandy mudstone, medium gray N5, fine grained sand and silt, bioturbated, terebellina traces, calcareous orange-gray layers observed at 2231.2, 2234.6, and 2235.4, organics	93A
2235.9	2240.9	5.0	muddy sandstone, dark gray N3 and light gray N7, very fine grained, heavily bioturbated, burrows, calcareous concretion 2236.2	94A
2240.9	2256.0	15.1	silty mudstone, dark gray N3 and lt. gray N7, bioturbated w/ rip-ups of laminated silty shale and some preserved fine laminations, burrows, soft sediment deformation terebellina traces, calcareous concretions, shell material	95A 96A 97A